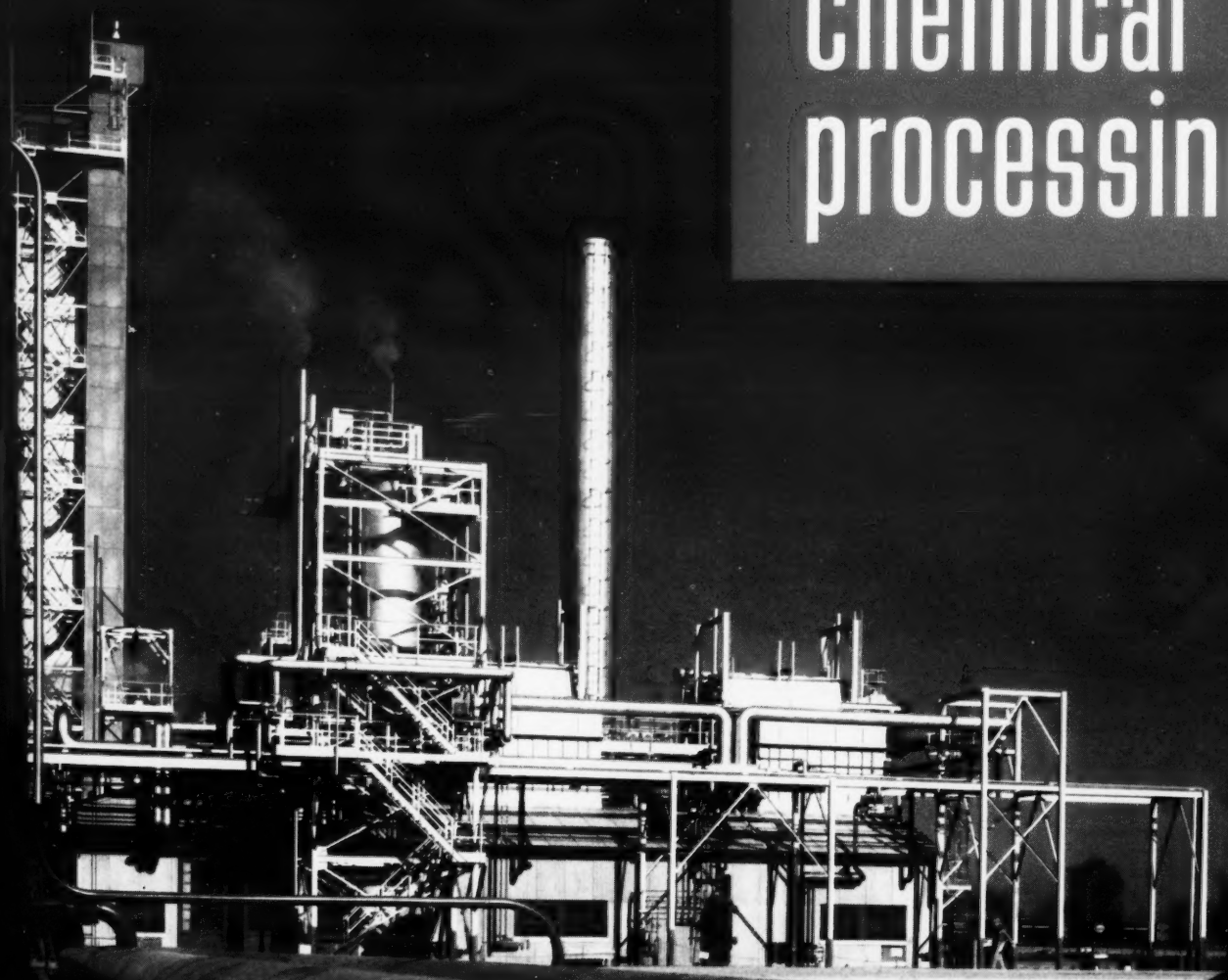
For Men Who Manage MAY 1956

chemical processing



W. R. GRACE AMMONIA PLANT IN MEMPHIS

Heat exchange at 300° below zero—see page 10

Table of contents—page 4

A PUTMAN PUBLICATION / *Executive Magazines for Industry*

GENERAL CHEMICAL ANNOUNCES ANOTHER NEW PLANT TO PRODUCE SULFAN® FOR FASTER, BETTER SULFONATIONS, SULFATIONS

NEW YORK, N. Y.—A large, new plant for the production of "Sulfan" Stabilized Sulfuric Anhydride is now being built at Chicago, Ill., by General Chemical, making additional tonnages of this versatile sulfonating agent available to industry.

The new plant will augment production at General's present Buffalo, N. Y., plant, where production has been expanded repeatedly during the past six years to meet the ever-growing demand for this easy-to-handle liquid form of SO_3.

"The Calumet plant has become a necessity as more and more industries discover the advantages of 'Sulfan' as a faster, better means of conducting sulfonations and sulfations," the announcement stated.

Here's How Sulfan Can Benefit You!

Users in many fields have found that "Sulfan" lets them produce finer sulfonated products at lower costs. One notable example is provided by producers of "low-salt" liquid detergents who find that it eliminates their salt removal problem entirely. And there are many others in a score of industries who are turning to "Sulfan" because it—

1. Furnishes more than 99% available SO_3 in easy-to-handle liquid form.
2. Offers 9 times as much usable SO_3 as 100% Sulfuric Acid, and more than 3 times as much as 20% Oleum for many operations.
3. Is 100% active—every pound that goes into process can be utilized for sulfonating.
4. Frequently eliminates spent acid and its disposal problems.
5. Permits increased batch sizes or more rapid through-put—often as much as double—without increasing size of equipment.

Still other advantages and economies may be offered by "Sulfan" in your own operations. If you sulfonate or sulfate, it will pay you to get all the facts about "Sulfan" now. Phone or write . . .

Basic Chemicals for American Industry

GENERAL CHEMICAL DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

Offices: Albany • Atlanta • Baltimore • Birmingham • Boston • Bridgeport • Buffalo • Charlotte • Chicago Cleveland • Denver • Detroit • Greenville (Miss.) • Houston • Jacksonville • Kalamazoo • Los Angeles Milwaukee • Minneapolis • New York • Philadelphia • Pittsburgh • Providence • San Francisco • Seattle St. Louis • Yakima (Wash.)

In Canada: The Nichols Chemical Company, Limited • Montreal • Toronto • Vancouver

*Stabilized Sulfuric Anhydride

When inquiring check CP 5119 opposite last page

THAT'S INTERESTING

Could it be?

A heliumized office could make you a more efficient thinker. Or so believes Vice Admiral (Ret) Charles B. Momsen. In a He-O_2 atmosphere you might work 12 hours a day without fatigue and do six hours work in four.

The helium-oxygen combination, which enables deep sea divers to work more efficiently and with less fatigue,

"Honest dear it's just a delayed helium reaction."

would be piped into offices, schools, hospitals, operating rooms, or other places where a high level of mental activity is expected.

Transition to a normal atmosphere might make you feel as though you've had a drink or two, but the effect would not last long (darn!).

To the rescue

Glycerine which helps keep "fog" from forming on automobile windshields has another helpful role, this time in soldering. A teaspoon of glycerine added to each cup of stainless soldering flux will make the job easier. Glycerine overcomes the tendency of the flux to stand up in drops on the smooth surface of the stainless steel (*Power*).

"Perfect iron" developed

Pure and perfect slivers of iron, having breaking strengths approaching one-million psi, have been produced on an unprecedented scale — as much as two inches long and a thousandth of an inch thick — by Westinghouse research scientists.

These iron "whiskers" are at least 10 times stronger than ordinary iron which has been drawn into wire and at least three times the strength of steel used in piano wire.

(*Please turn to page* 243)

chemical processing

(CHEMICAL PROCESSING PREVIEW)

for men who manage

Vol. 19 May 1956 No. 5

Serving more than 45,000 circulation in these industries:

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OTHER SUBSCRIPTIONS — from "non-qualified" persons (those who are not key processing men in the chemical industries) — are accepted at $1.00 the copy, or $10.00 the year. Such subscriptions are not counted as "industry circulation" on BPA audit reports.

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FLOWLINE
TRADE MARK
STAINLESS STEEL, MONEL, NICKEL and ALUMINUM WELDING FITTINGS
Preferred for Dependable Corrosion Service

The Welding Fittings organization — recognizing the superiority of welded piping for corrosion service — was the first to standardize, manufacture, and stock a complete line of stainless steel welding fittings.

The tee shown above—typical of all FLOWLINE Welding Fittings—provides unique features that have been developed through long, intensive specialization in design and production of welding fittings for corrosion service.

FLOWLINE fittings—tees, ells, reducers, stub ends, and caps—are available in sizes ½" through 12", in Schedules 5S, 10S, 40S, and 80S.

Features of FLOWLINE Tees

- Cold formed — seamless — by the exclusive Welding Fittings process.
- Reinforced crotch—tee is stronger than pipe with which it is used.
- Full center to face dimensions.
- Smooth interior walls.
- Ends machine tool cut and finished.
- Annealed, cleaned bright, passivated.
- Heat number permanently stamped on each tee as record of actual analysis and physical properties.
- Every tee is marked with type of metal, size, schedule, wall thickness, and FLOWLINE trade mark.

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W-10 *World's Largest Manufacturer of Stainless Welding Fittings*

When inquiring check CP 5120 opposite last page

Over the editor's shoulder

What's in a title?

Assistant editor—it sounded like a desk job. But titles, like appearances, are deceiving. Shortly after joining CHEMICAL PROCESSING'S editorial staff in July of 1955 this editor learned that stories aren't found at a desk. A lot of ground has to be covered to get them.

A lot of ground in a lot of places: to Stauffer Chemical Co., in Hammond, Ind., for a corrosion story and photos (beginning on page 114 of this issue); to Philadelphia, Ambler, and West Chester, Pa., as well as New York City and Chicago for stories that you will see in future issues — and they tell me this is just the beginning.

The Philadelphia trip included the Plant Maintenance and Engineering Show for a check of the latest in corrosion control, material handling, and plant equipment. Wherever story possibilities are to be found, a CP editor will be there digging.

Perhaps we'll have the pleasure of working with you on a story soon. Be on the lookout for the man with the camera and brief case.

Assistant Editor

- For more information on articles and advertisements in this issue, check the Reader Service slip opp. last page
- The product directory, pages 234 to 236, is your guide to all articles and advertisements
- To subscribe to this magazine, see reader-qualification form opp. last page

Highlights in this Issue

GUEST EDITORIAL
Concern for cost — Robert C. Hood 6

NEW SOLUTIONS OF PROCESSING PROBLEMS
Drop hydrogen to −300°F with −305° heat sink 10
Fluidized drying of limestone 12
Keeps track of downtime — and causes 14
Freon refrigerants facilitate neoprene production 16

MATERIALS
Promise savings in decolorization 34
Hydroabietyl alcohol-modified alkyds retain their gloss 46

IDEAS
Florida's first synthetic NH_3 plant 68
Coats polymers on metal, glass, wood and ceramics 76

INSTRUMENTATION AND CONTROL
Senses liquid level, actuates control — pneumatically 82
Strain gages of foil for trial use 95

CORROSION CONTROL
Aluminum withstands ammonium nitrate, saves $125,000 104
Vinyl coating prevents tank corrosion at Stauffer 114

MATERIAL HANDLING
Recharge 60 batteries daily without downtime 120
Swing-up engine hood marks truck redesign 124

SAFETY
Eliminate explosive combinations of fumes, vapors 140
Fire doors with a brain 146

FOR THE LABORATORY
Three X-ray techniques solve variety of research problems 150
Infrared spectrometer can be operated by anyone 158

PROCESSING EQUIPMENT
Radiant-heating furnaces cut fuel costs by 1/3 160
Turbulent entrainment dryer dries solids in seconds 170

PACKAGING
Aerosol unit to expel in six seconds 174
Roller support makes strapping easy 179

ENGINEERING AND MAINTENANCE
More heat in process, less in condensate 184
Plug valve design assures sterile conditions at Merck 204

OTHER REGULAR FEATURES

That's Interesting	2	Briefs from Other Magazines	180
Convention Schedule	5	New Literature	212
Highlights for Next Month	8	Engineering Data	216
Chemical Expansion	62	Product Directory	234
Recent Books	136	Advertisers' Index	237

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THIS MONTH'S COVER

. . . shows the W. R. Grace ammonia plant at Memphis. Heat exchangers in the hydrogen purification step operate at −300°F . . . with a temperature difference (△T) of only 5°F at cold end. Details of design and operation are explained in story which begins on page 10.

Apr 29-*May* 3. The Electrochemical Society, Mark Hopkins Hotel, San Francisco, Calif.

May 3-4. Commercial Chemical Development Assn., Pocono Manor.

May 6-9. The American Institute of Chemical Engineers, Roosevelt Hotel, New Orleans, La.

May 9-11. American Institute of Chemists, Annual Meeting, Statler Hotel, Boston, Mass.

May 9-11. Western Material Handling Show and Conference, American Material Handling Society, Western Livestock Exhibition Building, Los Angeles, Calif.

May 10-11. Conference on Atomic Energy, Southwest Research Institute, San Antonio, Texas.

May 14-17. Division of Refining of The American Petroleum Institute, Mid-year Meeting, Montreal, Canada.

May 14-17. Design Engineering Show, Convention Hall, Philadelphia, Pa.

May 16-18 Synthetic Organic Chemical Manufacturers Assn., Skytop.

May 20-22. Chemical Specialties Manufacturers Assn., Mid-year Meeting, Drake Hotel, Chicago, Ill.

May 22-23. Chemical Market Research Assn., Biltmore Hotel, New York, N. Y.

May 27-*June* 2. American Society for Testing Materials, Fourth Conference on Mass Spectrometry, Netherlands Plaza Hotel, Cincinnati, Ohio.

May 28-30. Chemical Institute of Canada, 39th Annual Conference and Exhibition, Sheraton-Mount Royal Hotel, Montreal, Canada.

June 4-8. National Fire Protection Assn., Annual Meeting, Hotel Statler, Boston, Mass.

June 5-8. The Material Handling Institute, Inc., All-industry Exposition, Cleveland Public Auditorium, Cleveland, Ohio.

June 11-15. Seventh National Plastics Exposition, The Society of the Plastics Industry, Inc., New Coliseum, New York, N. Y.

June 12. Synthetic Organic Chemical Manufacturers Assn., Luncheon Meeting, New York, N. Y.

June 17-22. American Society for Testing Materials, Annual Meeting and 12th Apparatus Exhibit, Chalfonte-Haddon Hall, Atlantic City, N. J.

June 25-29. American Institute of Electrical Engineers, Summer and Pacific General Meeting, San Francisco, Calif.

August 20-31. Summer Program on Molecular Engineering, Massachusetts Institute of Technology, Cambridge, Mass.

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MODEL 200-A uses an input of 10,000 ohm resistance potentiometers as an input transducer providing 10 to 1 scale expansion and origin positioning. Available standard digital input accessories are essentially inputs of this type. Any resistance potentiometer will provide an analog input for this configuration.

MODEL 200-B, used for D.C. signal input, has full scale sensitivities of 5 millivolts and an input impedance of 1,000 megohms. Utilizing standard reference cells, this model provides drift-free operation. Available external reference voltages may be substituted. A plug connection is provided to facilitate the quick interchangeability of input sections.

now FOR SIMPLIFIED OPERATION

Precision Vernier Dials provide an accurate method for obtaining fine adjustment during operation. Optional point plot or continuous line plotting is a feature of both models. Selection is by front panel manual control. A new, simplified pen of one-piece design-used for point or continuous plotting—eliminates bottles and tubes, permits rapid changing of ink colors. Independent action of the X and Y axis is achieved with Librascope's unique "Floating Gear Train." No cables, tapes or lead screws to cause lost motion, cable stretching or drifting out of alignment. The 120° concave cylindrical plotting surface provides full visibility . . . is completely illuminated.

now FOR WIDER APPLICATION

These fast, dependable general purpose plotters feature 0.1% accuracy, are suited for wide applications where rapid graphic presentation of data is required, such as: laboratory testing, computers, data handling systems, wind tunnel, missile tracking and quality control testing of transistors and other electronic components. Input selection includes Punched Card and Tape Converters, Decimal Keyboards and Binary Converters. Model 200-A can plot from Flexowriter tape in any code or directly from the Tape Punch cables of many digital computers. Subchassis can be supplied to handle time-shared X versus Y plots, or other special circuitry. Write today for details.

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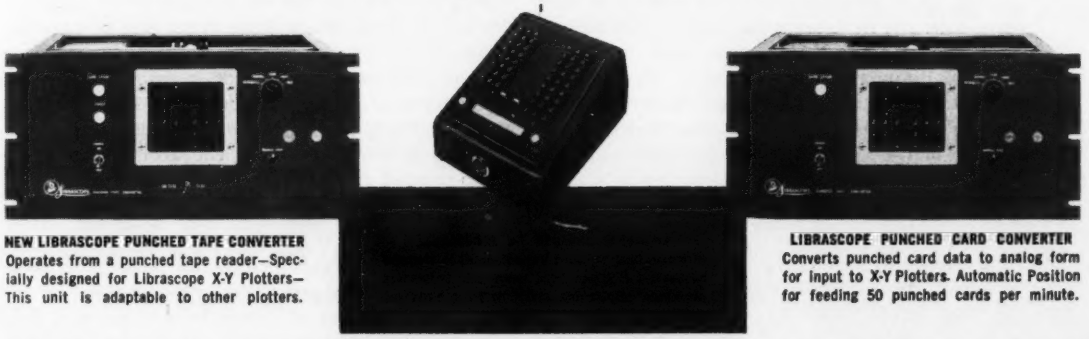

NEW LIBRASCOPE PUNCHED TAPE CONVERTER
Operates from a punched tape reader—Specially designed for Librascope X-Y Plotters—This unit is adaptable to other plotters.

LIBRASCOPE PUNCHED CARD CONVERTER
Converts punched card data to analog form for input to X-Y Plotters. Automatic Position for feeding 50 punched cards per minute.

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Here are some of the important points of Mr. Robert C. Hood's address, which he presented at the American Management Association's Fall (1955) Personnel Conference, New York, N.Y.:

- The most dynamic factor in costs are people's attitudes.
- Ansul's experience with cost reduction supports a basic underlying theme of participative management — a proven social science principle — that "people support what they help create . . ."
- In this case history operating management set its own goals — there was no arbitrary directive from top management. The act of setting the goals insured enthusiastic support and lasting effects.
- This is an example of how an attitude can be incorporated into the bloodstream of a company.

CONCERN FOR COST

ROBERT C. HOOD, President
Ansul Chemical Company
Marinette, Wisconsin

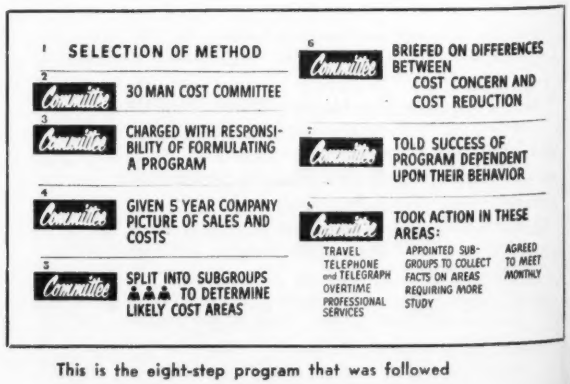
High business costs are a common problem facing industry today. While it is true that sales curves have risen, their rate of increase has certainly not been as great as costs. Ansul, like many other firms, was aware of the problem and wanted to do something about it. About two years ago we decided to call a meeting of the executive committee to discuss the problem and determine what course of action could be taken to solve the problem.

There seemed to be three possible ways of coping with the problem: (1) An across-the-board cut of a fixed percentage, arbitrarily decided upon by the president or general manager; (2) a series of selective cuts decided upon by the president and his executive committee; (3) a participative cost program, without any fixed percentage, in which all top policy and operating people are involved.

The committee decided that the first method was too arbitrary — it did not really tackle the problem — it merely saved money. Take in the case of advertising. Instead of cutting the ad budget 10 per cent, sound business practice might, perhaps, demand an increase of 25 per cent. In other areas, sound business practice might permit a manager to cut 100 per cent instead of only 10 per cent. The second method was also rejected. It was considered unsatisfactory because it was felt that it too did not go deep enough.

We selected the third method because we thought that the company should tackle this problem the same way that it tackled other problems — namely, by the direct participation of people in the company. Our reasoning was that the problem of costs is a problem of *people's* attitudes more than a problem of *things*. We figured that if we could motivate our people to be cost conscious, we could cut costs. To test this idea, we went "outside" to collect information on similar approaches to cost cutting. We discovered the work of Dr. Chris Argyis of Yale and Dr. Floyd Mann of the University of Michigan and learned successes of other companies.

Having decided on the method to be used, we selected a 30-man committee to do the work. Consisting of both policy and operational personnel, this group was composed of the people who were actually spending the money. The committee was provided with data


1 SELECTION OF METHOD
2 Committee 30 MAN COST COMMITTEE
3 Committee CHARGED WITH RESPONSIBILITY OF FORMULATING A PROGRAM
4 Committee GIVEN 5 YEAR COMPANY PICTURE OF SALES AND COSTS
5 Committee SPLIT INTO SUBGROUPS TO DETERMINE LIKELY COST AREAS
6 Committee BRIEFED ON DIFFERENCES BETWEEN COST CONCERN AND COST REDUCTION
7 Committee TOLD SUCCESS OF PROGRAM DEPENDENT UPON THEIR BEHAVIOR
8 Committee TOOK ACTION IN THESE AREAS:
TRAVEL
TELEPHONE and TELEGRAPH
OVERTIME
PROFESSIONAL SERVICES
APPOINTED SUB-GROUPS TO COLLECT FACTS ON AREAS REQUIRING MORE STUDY
AGREED TO MEET MONTHLY

This is the eight-step program that was followed

Our guest editor this month, Mr. Robert C. Hood, became president of the Ansul Chemical Company in 1949, at the age of 33. Since that time he has become widely known throughout the US and abroad as a pioneer in the application of social science research to the solution of management problems.

In January 1954 he was selected as a member of a special training mission to Austria, sponsored by the Foreign Operations Administration of the US State Department. In January of 1956 he was asked by the State Department to represent American industry at the International Human Relations Conference in Rome, Italy.

Mr. Hood attended the University of Wisconsin and served three years with the US Coast Guard during World War II as a gunnery officer. In the state he is a member of the Industrial Advisory Committee of the University of Wisconsin. He is married and father of three daughters.

on costs and sales for the preceding five years, after which sub-groups were formed to isolate most likely areas where costs could be shaved. The committee was thoroughly briefed on the differences between cost concern and cost reduction. They were told that the most decisive factor in the success of the program probably would be the cost concern activity of the group itself.

The committee went to work in the areas in which all members had a common interest, such as travel,

(*Please turn to page* 233)

- NET PROFIT UP 40%
- STOCK VALUE UP 30%
- WAGES, SALARIES UP $40,000
- EXPENSE BUDGETS = 100%
- PERMITTED FASTER GROWTH RATE

These are the results that were achieved

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BIRD RESEARCH AND DEVELOPMENT CENTER
TEST REPORT No. 4093
Dates: January 4, 5, 6, 1956
Company: Blank Mining Co.
Blankton, Montana
Material: Uranium Ore
Problem: Dewater and wash
2000 tons per day. Three
washes, each ½lb. water
per lb. solids
Sample:
Amt. Three 30-gallon drums
Slurry: Viscosity 100 Sp.
gr. 1.50 pH 2.0 Temp. room
Solids: See attached screen
analysis
Size: MAX 35 mesh
Feed: to contain 45.0% solids
Description of test: The material
as received was diluted by
tap water to a consistency of

BEFORE YOU INVEST A DOLLAR . . .

in equipment, Bird can give you the right answer to the question, "which filter will do the best job for me and do it *profitably*?"

This time-saving, money-saving service is the function of the Bird Research and Development Center, a completely equipped test plant with its own full time crew of experts, devoted exclusively to test work and application development involving solids-liquids separations.

It's yours to use, just as though it were right in your own plant. Make the most of it.

The Main Test Floor of the Bird Research and Development Center provides thirty feet of headroom and lifting facilities for loads up to 6000 lbs. Test engineers are virtually unhampered in the type and volume of materials that can be handled and in the range of temperature, vacuum and power at their disposal.

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Builders of: BIRD CONTINUOUS SOLID BOWL CENTRIFUGAL FILTERS
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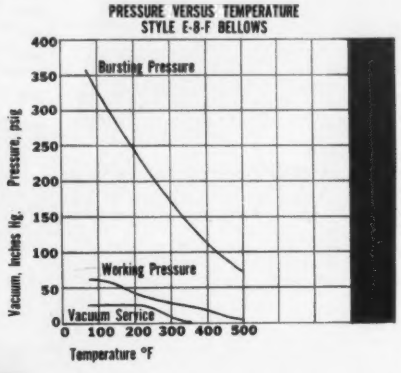
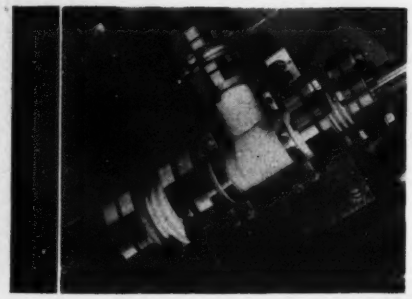
DORÉ INTRODUCES NEW QUALITY CONTROL CHECKS AND CHARTS TO ASSURE OPTIMUM SAFETY AND PERFORMANCE

OF TEFLON BELLOWS FLEXIBLE COUPLINGS TEFLON LINED EXPANSION JOINTS

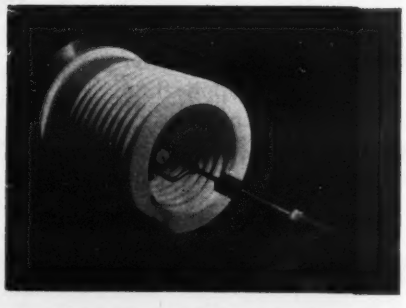
1. ***For the first time in the industry*** **pressure-temperature charts showing recommended operating pressures and actual burst pressures are furnished with each Doré Teflon Bellows, Flexible Coupling, and Expansion Joint. This confirms our pretesting — takes the guesswork out of operating conditions.**





2. ***For the first time in the industry*** **each Doré Teflon Bellows, Flexible Coupling, and Teflon Lined Expansion Joint is cycled with cold water at pressures 50% greater than recommended operating pressures prior to shipment.**

3. ***For the first time in the industry*** **Doré's Teflon Bellows, Flexible Couplings, and Teflon Lined Expansion Joints are gauged for uniform wall thickness of each convolution at time of manufacture. This eliminates variation of wall thickness — the major cause of bellows rupture.**



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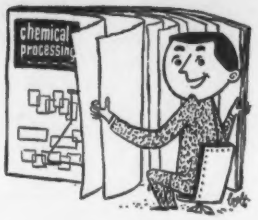


looking ahead to next month . . .

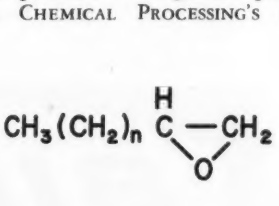
Even the gas is dry in Kansas

June's Engineering section tells how Cooperative Farm Chemicals Assn., Lawrence, Kansas, removes moisture from gas streams in the manufacture of ammonia. Dual packaged dehydration units, using activated silica as an adsorbent, do the trick.

Much-traveled Associate Editor Gordon Weyermuller is pictured as he leaves Irving C. Roth, Administrative Assistant for Co-Op Chemicals, on one of Gordon's recent swings through the Western states.

New fields for Becco

Becco Division of Food Machinery and Chemical has moved into a new field of chemical products . . . long-chain epoxidized olefins. CHEMICAL PROCESSING'S editors



talked to Becco's Director of Research and Development, Dr. P. H. Margulies, and in the June Materials section, bring you a summing up of the new materials . . . their properties and uses.

Doubles heater life

Boiling 88% sulfuric acid, together with the boiling liquid's vibration, used to play hob with immersion heating tubes at the Texas Company's refinery at Port Arthur, Texas. Now, through use of a new material, service life of the tubes has been stretched from less than a year to over two years.

CHEMICAL PROCESSING brings you the story in next month's Corrosion Control section.

Lubrication . . . by the clock

Hand oiling of machinery at Owens-Corning's Ashton, R. I., textile yarn plant caused high maintenance costs and traces of oil in yarn. Answer to dilemma was centralized lube system, extending throughout twisting machine line and run by time clock.

Next month's Engineering section describes system and tells results.

TNT and fresh air

An essential ingredient in TNT handling is plenty of fresh air in the right places. TNT dust likes to collect in places where it might explode and, too, the dust and fumes are highly toxic. Key to safe operation is constant checking and rechecking of ventilation equipment.

Associate Editor Bruce Fader talked to Richard Nemanich, chief of the Enginering Branch of the Engineering and Facilities Division of Joliet Arsenal and, next month, tells you how they do it and how they've earned a perfect safety record.

Screen test for exchange resins

In evaluating ion exchange resins, researchers have found that screen analysis to find bead size distribution is an important factor. Making these "screen tests", though, poses a tough problem. Beads expand when wet,

Here's a quick preview
of features you'll find
in June CHEMICAL PROCESSING

shrink when dry, and decrepitate when rewetted . . . thus moisture content has to be controlled for testing.

Wet tests of the beads require expert technicians who know how to get around screen blinding and plugging. When these testers found that they had trouble in reproducing each other's results, Permutit's director of research, M. E. Gilwood, built a machine to run the tests. Next month CHEMICAL PROCESSING explains how — and how well — it works.

Guiding the reactor

Few processes present more difficult control problems than a nuclear reactor. Power levels can fluctuate violently and the process possesses no "capacity" to stabilize itself.

Penn State's new research reactor, operating near its full 100-kw power level, is controlled by a fully integrated, automatic system. It guides the operation through various critical power levels and automatically holds power within plus or minus one per cent of the desired operating level. You'll find the story of what it is and what it can do in next month's Idea section.

And in July . . . CHEMICAL PROCESSING features its Corrosion Control section. Guest Editor will be F. L. LaQue, "Doctor of Deterioration and Corrosion." His subject . . . the role of management in controlling corrosion.

You'll learn, from the New Solutions stories, how cathodic protection, coatings, inhibitors, corrosion-resistant materials and changes in processing methods have licked other people's corrosion problems.

You'll find more "Corrosion Keys" (graphic presentation of corrosion-resistance of various materials), digests of some important technical papers on corrosion control, latest developments and new products for battling corrosion.

Putting the Chill on NH_3

The Vilter Manufacturing Co. of Milwaukee, Wis., makes, among other interesting and useful products, ammonia (NH_3) synthesis coolers. These coolers must contain the newly-made hot gas at a pressure of 10,000 psi and reduce its temperature by means of cooling water conducted over the tubes.

To meet its exacting requirements, Vilter chose B&W Seamless Tubing, made for high-pressure service. All tubing in these coolers is tested at 15,000 psi.

To bend these heavy-wall tubes to a 4″ radius, 3⅛″ off the vertical plane, is evidence of Vilter's skill and craftsmanship at work.

And for evidence of how B&W tubing can help improve your own skill and craftsmanship, get in touch with Mr. Tubes, or write for Bulletin 408. The Babcock & Wilcox Company, Tubular Products Division, Beaver Falls, Pa.

TA6032-P

Seamless and welded tubular products, seamless welding fittings and flanges—in carbon, alloy and stainless steels

When inquiring check CP 5124 opposite last page

Grace Chemical Company's Memphis ammonia plant — rated at 250 tons of anhydrous ammonia and 150 tons of urea a day — cools hydrogen at −300°F for purification. Low-temp heat exchangers . . .

drop hydrogen to -300°F with -305°F heat sink

BRUCE FADER, Associate Editor
Verified by **L. C. SKINNER,** Chief Engineer
Grace Chemical Company

In designing the Memphis ammonia plant of the W. R. Grace & Co. subsidiary, engineers solved several low-temperature heat exchange problems. In purifying hydrogen to produce synthesis gas, incoming hydrogen-rich gas at 275 psig is cooled below −300°F. While moisture and carbon dioxide are substantially removed (scrubbing in MEA and desiccant drying) just before this step, design has to allow for freeze out of trace quantities and process upsets which could freeze up the heat exchanger with solid CO_2, or moisture, or both.

From this cooler, hydrogen is fed to a liquid nitrogen scrubbing column where carbon monoxide, methane and argon are removed. Part of the liquid nitrogen used in this operation vaporizes into the emerging pure hydrogen stream.

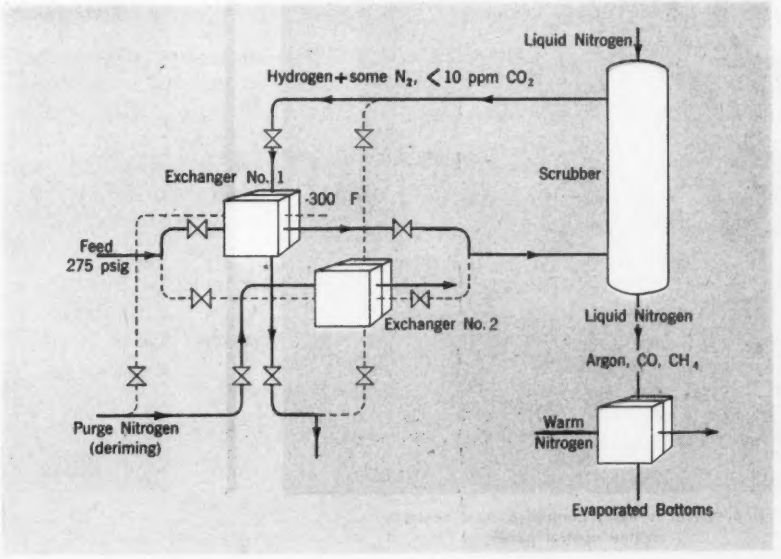
Further cooled in the nitrogen scrubbing step, this hydrogen is returned to the cold side of the exchanger as the heat sink. After leaving exchanger it has enough additional nitrogen added to make up a 3:1 ammonia ratio and is sent on to reactor.

Tower bottoms from the nitrogen scrubbing step are reboiled with warm nitrogen as a heat source.

To handle these two heat exchange steps, plant uses brazed aluminum units. One such heat exchanger is used as reboiler and two (with alternate operation connections) cool incoming hydrogen.

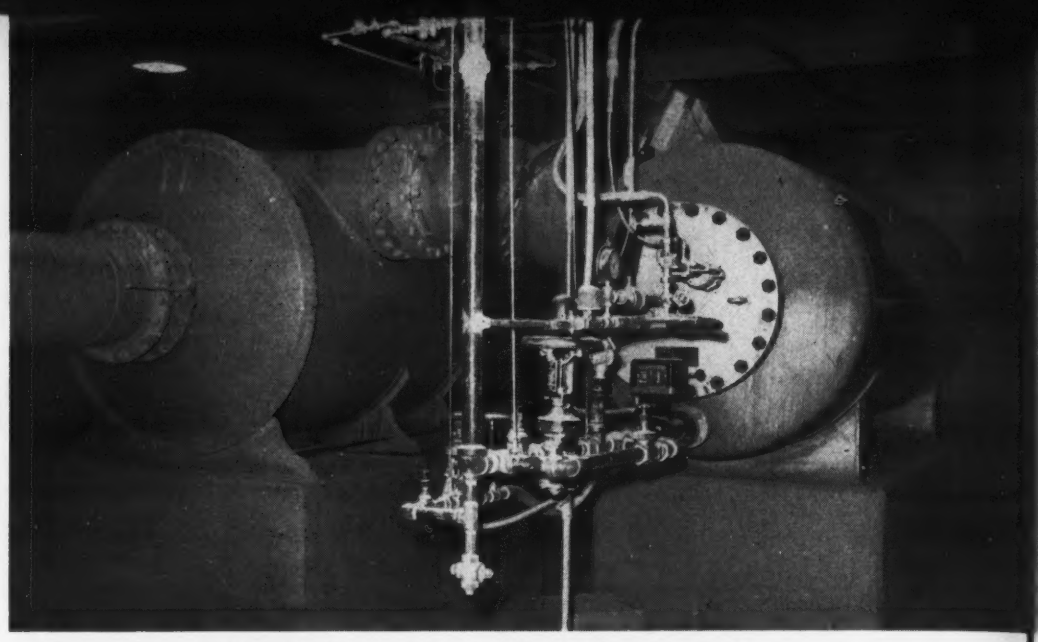
(*Please turn to page* 22)

General view of Grace ammonia plant shows towers (left to right) for synthesis gas caustic scrubber, carbon dioxide absorber, and monoethanolamine reactivator



Note alternate flow paths (dashed lines) for hydrogen and deriming nitrogen in the hydrogen purification process

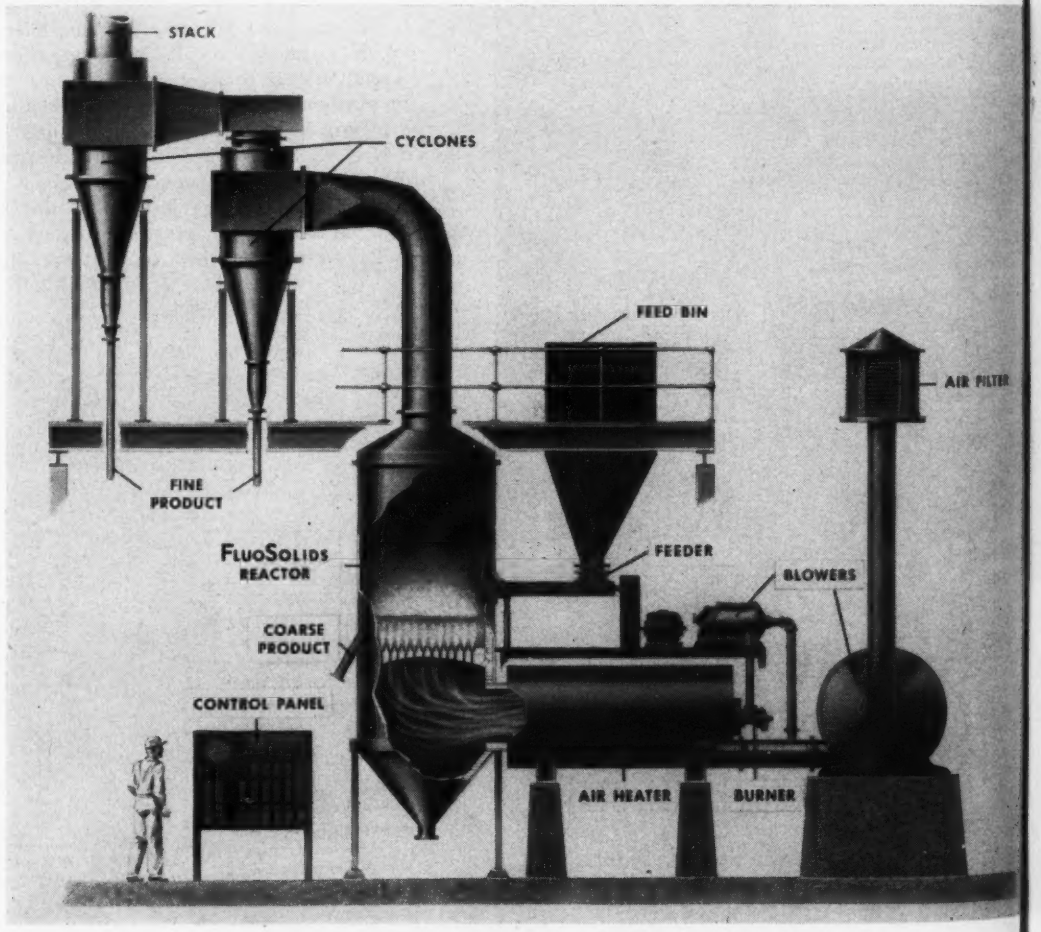
Feeder automatically feeds dried cement rock into roll crusher



Air blower (left) and gas-fired air heater (right) produce upward flow of hot gas through reactor (right rear)

Photos by CP Staff

Drying system is easily controlled from centrally-located control panel



Drawing shows arrangement of equipment for fluidized drying, sizing of limestone. Marquette installation has only one cyclone

In line with their modernization and expansion program, Marquette Cement streamlines operations, cuts costs, and boosts production by . . .

FLUIDIZED DRYING OF LIMESTONE

System operates continuously and automatically; handles up to 60 tons cement rock per hour

TED F. MEINHOLD, Assistant Editor
Data verified by **HENRY L. RESTARICK,**
Plant Superintendent
Marquette Cement Manufacturing Company
Rockmart, Georgia

PROBLEM: When Marquette Cement Manufacturing Company, Chicago, Illinois, purchased the Rockmart, Georgia, plant of Southern States Portland Cement Company two years ago, engineers immediately began to look for ways to improve operations and boost production. One of the first things that they tackled was the method of drying and sizing cement rock (limestone).

Existing equipment used for this part of the process was slow, dusty, and expensive to operate. It also occupied an excessive amount of floor space. The dryers — two old 40′-long rotary units — had "seen their best days" and required considerable fuel and maintenance.

Solution: About two years ago, company replaced the equipment with a Dorrco FluoSolids system. Designed to dry and size materials simultaneously, system operates on the principle of fluidization and is believed to be the first of its kind installed in a cement plant. Arrangement of equipment is shown in accompanying drawing.

Operation is continuous and automatic. Relatively coarse feed (½″ and smaller), containing about 1½-2½ per cent moisture, is fed into the reactor — entering just above the fluid bed. Low-pressure fluidizing air, delivered by blower and heated in the gas-fired heater, passes up through a non-sifting constriction plate located near bottom of the reactor. Plate contains 19 holes spaced so as to provide uniform air distribution across bed.

Upward moving stream of hot gases fluidizes the solids in the bed, drives off moisture, and classifies the solids into two fractions according to particle size. Larger particles which are not carried off by the gases remain in the fluid bed and are continuously discharged from the reactor. Thoroughly dried finer particles are carried aloft and recovered from exit gases in cyclone.

Bed temperature is about 125-135°F — being uniform with no localized hot spots. It can be controlled automatically within 5°F. Because there are no moving parts inside reactor which are exposed to high temperatures, scaling and maintenance are kept to a minimum.

Results: In operation since March 1955, system drys up to 60 tons cement rock per hr — more than double the previous capacity. Moisture content of dried product is essentially 0.0 per cent. Total floor space occupied by equipment is approximately 43 x 11 x 30′ high — about ⅛ that needed by old equipment. Fuel consumption has been cut in half from the previous requirements. Drying system operates dust-free — resulting in better working conditions. Labor costs are low since only one man per shift is needed to run the entire feed preparation plant which includes the drying system as well as crushing, grinding, and conveying equipment.

Shutdowns present no problem. It is necessary only to turn off fuel, stop feeding, and shut off blower. Reactor may be brought back to normal operating temperature simply by starting blower, turning on and igniting fuel, and resuming feeding.

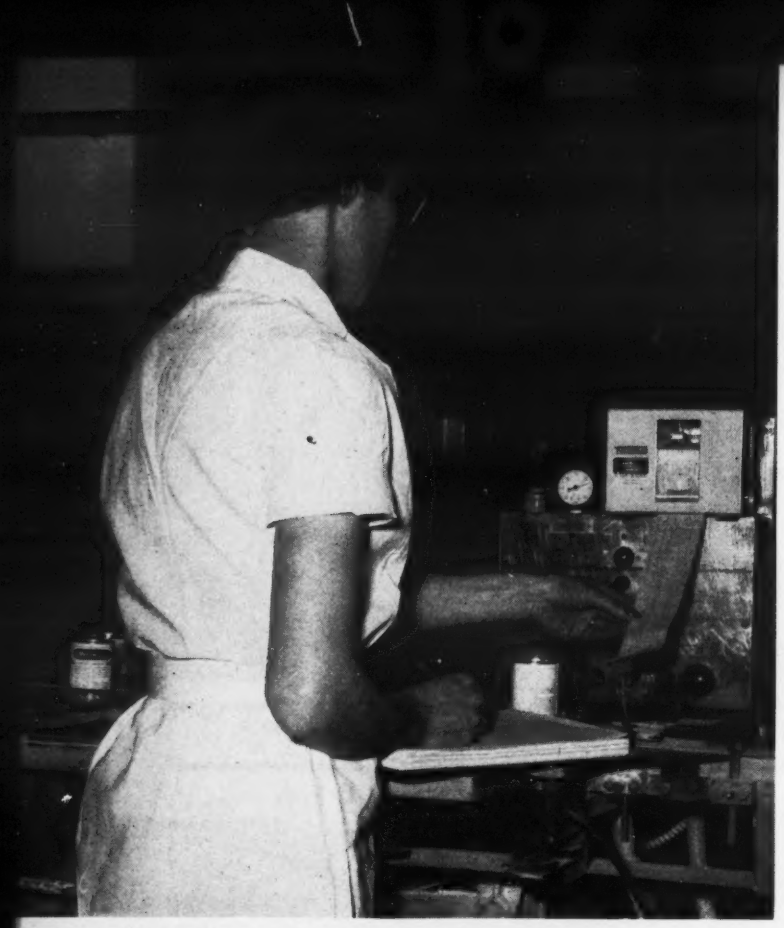
(FluoSolids system was developed by Dorr-Oliver Incorporated, Dept. CP, Barry Place, Stamford, Conn. . . . or for more information check CP 5125 on form opposite last page.)

new solutions
of processing problems

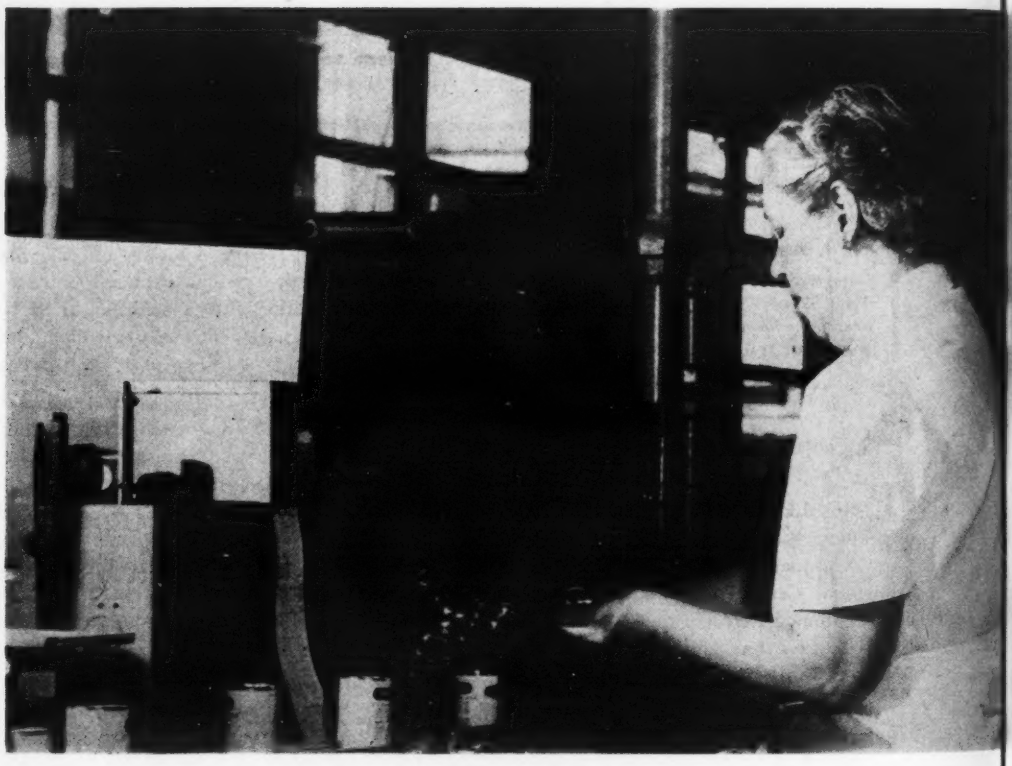
Finding and fixing causes of downtime on packaging lines can be baffling and frustrating. At G. D. Searle & Company's pharmaceutical plant an "impartial observer" . . .

KEEPS TRACK OF D

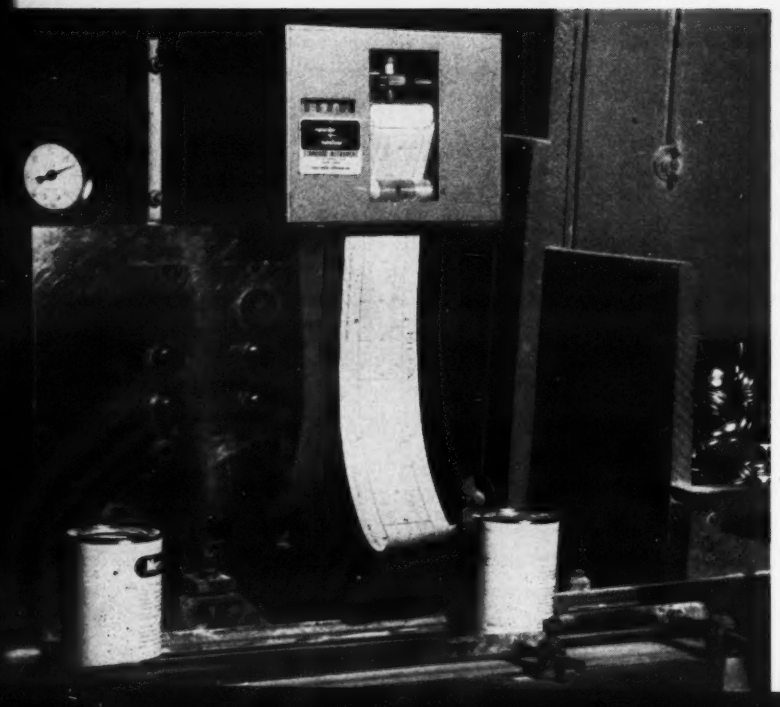
Photos by CP Staff



Log sheet shows apparent cause of shutdown noted on record



Operation recorder is located just ahead of capping operation on G. D. Searle's packing line



Close-up of operation recorder shows tape record, running time counter (left of tape), and start-and-stop controls

DOWNTIME — AND CAUSES

Efficiency of the operation has risen several per cent in a few months, and maintenance time is expended where it is needed — *not in trying to find where it is needed*

BRUCE FADER, Associate Editor
With **WILLIAM GRIGG,** Packaging Supervisor
G. D. Searle & Company
Skokie, Illinois

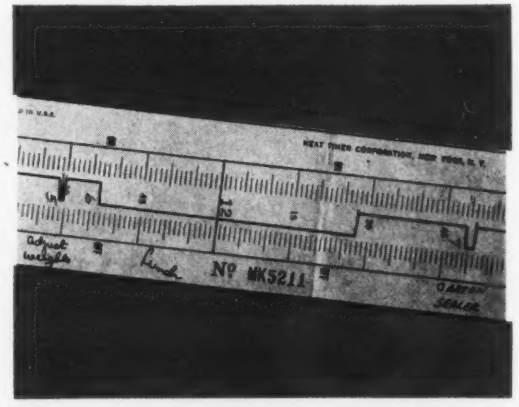
Problem: While packaging operations at G. D. Searle & Company were able to keep pace with production, efficiency on one line was spotty. Here, two, four, eight, and 16-ounce cans of Metamucil (a demulctant laxative) were put up at average rates of 1500 to 1700 per day. All containers were wide-mouth, friction-top cans.

Various common troubles cropped up and were licked, but neither maintenance nor performance of the line were predictable.

Solution: In order to get a better view of what mechanical troubles were holding up production, Searle installed an operating-time recorder and totalizer in September of 1955. This device combines a running time counter which shows total operating hours and also a strip chart record which shows starts and stops to within fractions of a minute. Standard tape speeds available are one inch every five minutes, one inch every fifteen minutes, or one inch per hour.

In installing this device, electrical actuating connections were made so that two filling heads were placed in series with conveyor motor and capping machine motor. Thus, if any of these components of the packaging line stop, recorder shows that line is shut down. At each shut down, line operators note cause or apparent cause. A written log sheet supplements notes made directly on the tape.

Cooperation of line operators, of course, is essential in making this scheme work. Timing device is in their plain view and is used by them. Before it was installed, its operation and the reasons for it were explained to the operators. There has been no feeling of "snooping" or checking operator efficiency — though operators admit that it is an impartial observer of their work.



Portion of tape record shows 1½ minute shutdown to adjust weight, lunch period, stoppage because of trouble at carton sealer

Three sources of information — operating tape record, written log sheets showing stoppages and reasons, and reports from quality control lab — are combined to give a complete detailed history of operation at this packaging line.

Results: In the few months that this device has been used, efficiency on the line has increased several per cent. Its records have been used to direct maintenance on the real trouble spots. Records tend to make everyone connected with this operation more maintenance conscious.

Line operators, too, like the smooth operation that results from the use of this device.

(Time recorder-totalizer is a development of Standard Instrument Corp., Div. of Heat-Timer Corp., Dept. CP, 657 Broadway, New York 12, New York . . . or for more information check CP 5126 on form opposite last page.)

When used in one of the largest industrial refrigeration systems in the world — equivalent to 288,000 household refrigerators —

Freon refrigerants facilitate neoprene production

Combination of flexible, non-hazardous, non-corrosive cooling chemical and compact refrigeration plant has worked so well at Louisville that a similar system will be used in DuPont's new neoprene plant at Montague, Mich., which will go on stream in late 1956

GORDON WEYERMULLER, Associate Editor
With **A. L. FRANKHOUSER,** Power Supt.
E. I. duPont deNemours & Co., Louisville, Ky.

Heart of DuPont's neoprene plant at Louisville, Ky. is the low-temperature refrigeration system in which Freon fluorinated refrigerants are used. Experience of the plant in the use of the fluorinated chemical in combination with the compact efficient refrigeration plant has been so favorable that a similar system, modified in some ways, will be used in DuPont's new neoprene plant at Montague, Mich., which will go into operation in late 1956.

One of the chief advantages found for Freon is its flexibility. Different types of the chemical are available for the exact temperature level required down to a very low range. At Louisville two types are used — Freon-12 (dichloro difluoro methane) and Freon-114 (dichloro tetrafluoro ethane). This provides versatility and reduces the amount of equipment needed.

The fluorinated refrigerant is non-hazardous, non-flammable, non-toxic, and non-corrosive. Latter property permits use of standard metals in most instances. At Louisville, carbon steel sheet is used for coolers and condensers. Cooler tubes are 85-15 brass while condenser tubes are copper. For −65°C service, 5% nickel steel is used to avoid low temperature stresses.

Another benefit obtained from the use of Freon, which is partly due to the design of the refrigeration system, is that it is not necessary to use high process

(*Please turn to page* 20)

Photos by CP Staff

◀ Use of centrifugal compressors makes refrigeration system much more compact than would be possible with other types of equipment

Large brine storage tank, with one-ton cylinder of Freon below, outside refrigeration plant ▶

Catalog gives histories of laboratory projects

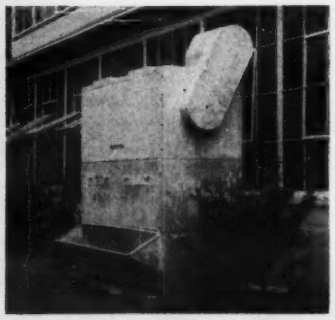
How equipment maker's research and development laboratory facilities enable nine manufacturers to develop new products and processes is reported in illustrated 12-page catalog. Facilities are described for conducting studies on vacuum drying, vacuum impregnation, vacuum metallizing, compression and injection molding, and tablet compacting and coating.

Bul 640 is issued by F. J. Stokes Machine Company, Inc., Dept. CP, 550 Taber Road, Philadelphia 20, Pa. When inquiring reader may simply check CP 5127 on Reader Service slip which is located opposite last page.

Cooling towers save plant $7000 per year . . .

use to cool water circulating through molding machines

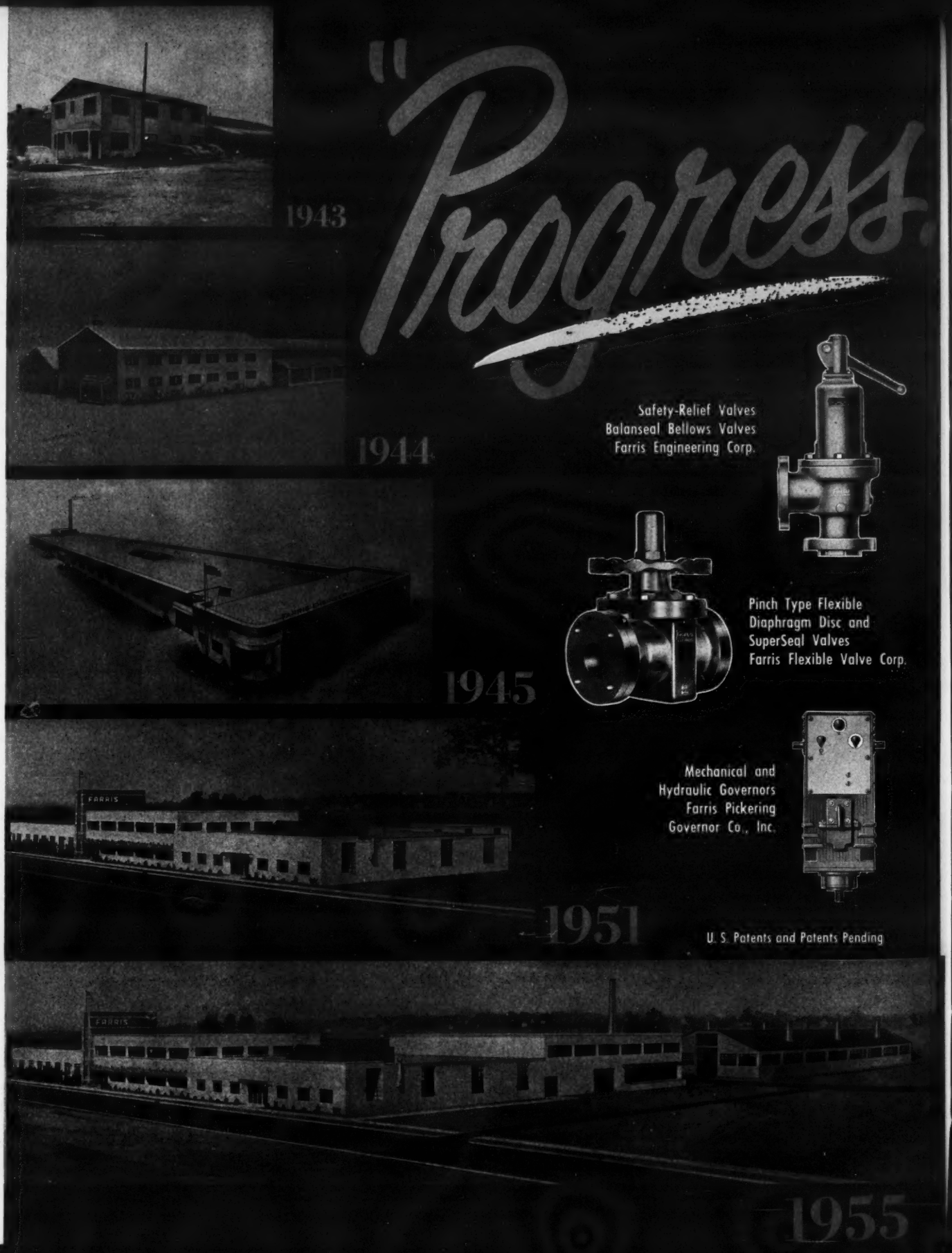
Cooling towers installed at Michigan Molded Plastic, Inc., Dexter, Michigan, have paid for themselves in only a few months. Used to cool water circulating through injection



Cooling towers are installed in outdoor court adjacent to building (Units are now enclosed for winter protection)

and compression molding machines, the two units have cut plant's quarterly water consumption from 14.5 million down to 3.5 million gallons. Annual savings are expected to amount to approximately $7000.

Both towers are installed at ground



.. through honest purpose"

The larger and more experienced a manufacturer becomes, the more he appreciates that PROGRESS is not restricted to simply producing fine products at fair prices. Rather, it is the sum total of all the services he renders to his customers day by day and year by year. It is unceasing vigilance to assure customer satisfaction . . . it is constant concern for improvement—for *better* products at even *better* prices . . . it is strict adherence to a commercial code of honor, like Farris' policy of "Progress—Through Honest Purpose".

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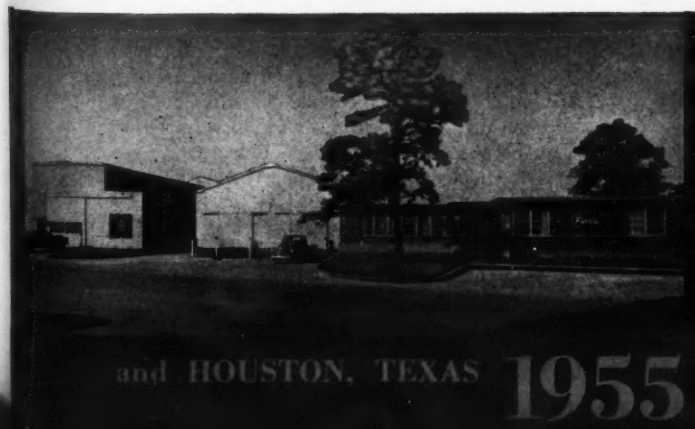
Behind our continuing growth and the world-wide recognition of Farris as a pacesetter in its field, is the fundamental belief that "honesty of purpose" when dealing with people is always to be trusted. Upon this belief we have grown . . . and, because they believe in the same things, our customers and friends have supported us. Here, beyond doubt, is proof that the right way to grow is THROUGH HONEST PURPOSE.



PROGRESS THROUGH Farris HONEST PURPOSE

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- Farris Hydroseal Corp.

level adjacent to the building in an outdoor court. One unit handles cooling water from 14 injection molding machines at rate of 126 gpm. Other tower cools water from 32 compression molding machines at rate of 165 gpm.

(Flow-Mizer cooling towers are product of Acme Industries, Inc., Dept. CP, 411 Mechanic St., Jackson, Michigan . . . or for more information check CP 5128 on the form which is conveniently located opposite last page.)

Pulp digester corrosion virtually eliminated by nickel alloy . . .

west coast and Arkansas mills solve growing problem

Problem: In recent years corrosion of pulp digesters in paper mills has increased markedly. An Arkansas mill experienced an average corrosion rate of 62 mils a year. Increased production, higher operating pressures, and process changes were contributing causes.

Solution: Digesters fabricated from steel, clad with a nickel-chromium alloy, were placed in service in the Arkansas mill and in a west coast kraft mill in 1951. Alloy has a thermal expansion coefficient similar to steel. It is amenable to all commercial cladding methods.

Results: Digester in Arkansas mill has shown no measureable decrease in thickness since installation five years ago. Corrosion has been virtually eliminated in both plants.

(Inconel nickel-chromium alloy is a product of The International Nickel Co., Inc., Dept. CP, 67 Wall St., New York 5, N.Y. . . . or for more information check CP 5129 opposite last page.)

For more information on product at left, specify CP 5130 . . . see information request blank opposite last page.

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When inquiring check CP 5131 opposite last page

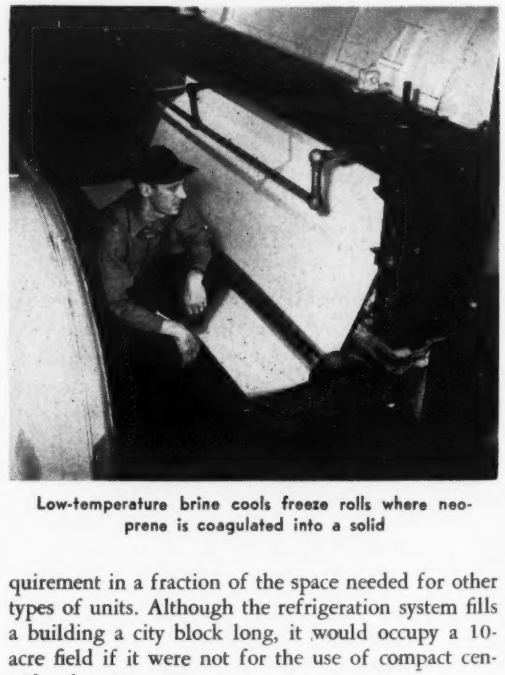
Freon Refrigerants

(*Continued from page* 17)

pressures. Another advantage of the fluorinated chemical is that contaminants can easily be removed by rectification. System is designed in such a way that contamination has rarely occurred at Louisville.

At the plant, about 9000 tons of refrigeration capacity (equivalent to 24,000 tons if used for air conditioning) is used to produce 600,000 lb of neoprene per day. The refrigeration system is one of the largest in the world — equivalent to 288,000 household refrigerators operating continuously, or enough to produce more than a billion ice cubes per day.

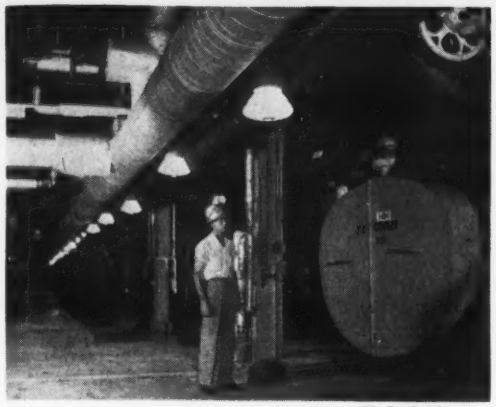
High-speed centrifugal compressors, handling large volumes of Freon, meet the huge refrigeration requirement in a fraction of the space needed for other types of units. Although the refrigeration system fills a building a city block long, it would occupy a 10-acre field if it were not for the use of compact centrifugal compressors.



Low-temperature brine cools freeze rolls where neoprene is coagulated into a solid

Minimum opportunity for friction in the compressors due to the use of centrifgual rotors rather than pistons in cylinders results in low wear and the exceptional reliability required for making neoprene. Maintenance has been extremely low. Plant has run for as long as two years without a shutdown, with only minor repairs made while operating. Some compressors that have been in service 10 years or longer have never had their covers off. Refrigeration system at DuPont requires a minimum of operating personnel.

At Louisville, steam turbine drives are used on the refrigeration compressors. Excellent load control is obtained with minimum variation in output refrigeration temperature. Turbine drive is economical, too, since a large portion of the exhaust steam can



CP Staff Photo

After being compressed, fluorinated refrigerant is used to lower the temperature of brine in these coolers by evaporation

be used in process. Good heat balance is assured by use of back pressure, mixed pressure, and condensing turbines.

Loss of refrigerant is kept to a minimum by maintenance of a tight system. Cooled brine is transferred to neoprene plant through insulated steel pipe. Line temperature losses have been kept to a minimum by locating plant equipment requiring lowest temperatures nearest to refrigeration system.

Refrigeration system in use at Louisville is set up along following lines: One-ton storage tanks for refrigerant are located out-of-doors. These tanks are normally empty but serve as storage vessels during a shutdown. Brine storage tanks are also outside. Refrigerant vapor is compressed, liquefied and then passes to vessels immediately below the compressors where it cools the brine. Brine is pumped to points in plant where cooling is needed. Freon is condensed for reuse in refrigeration cycle. In the summer, 40,000 gpm of Ohio River water is used for condensing.

At Louisville, three different temperature brines are used to meet refrigeration requirements. These are:

0°C
−15°C
−65°C

In order to cool this brine, two types of the fluorinated refrigerant are used as follows: Freon-12 is used in first stage of compressors for −65°C cooling. Freon-114 is used for the first stage of −65°C condensing as well as for the −15 and 0°C temperatures. In entire system, 20,000 lb of F-12 and 50,000 lb of F-114 are in use.

More than ½ million lb of methylene chloride brine is in service for the low-temperature requirements. For the higher temperatures, 2½ million lb of calcium chloride brine is in use.

Coldest brine, −65°C, is used adjacent to refrigeration plant in the manufacture of monovinyl acetylene.

(*Please turn to next page*)

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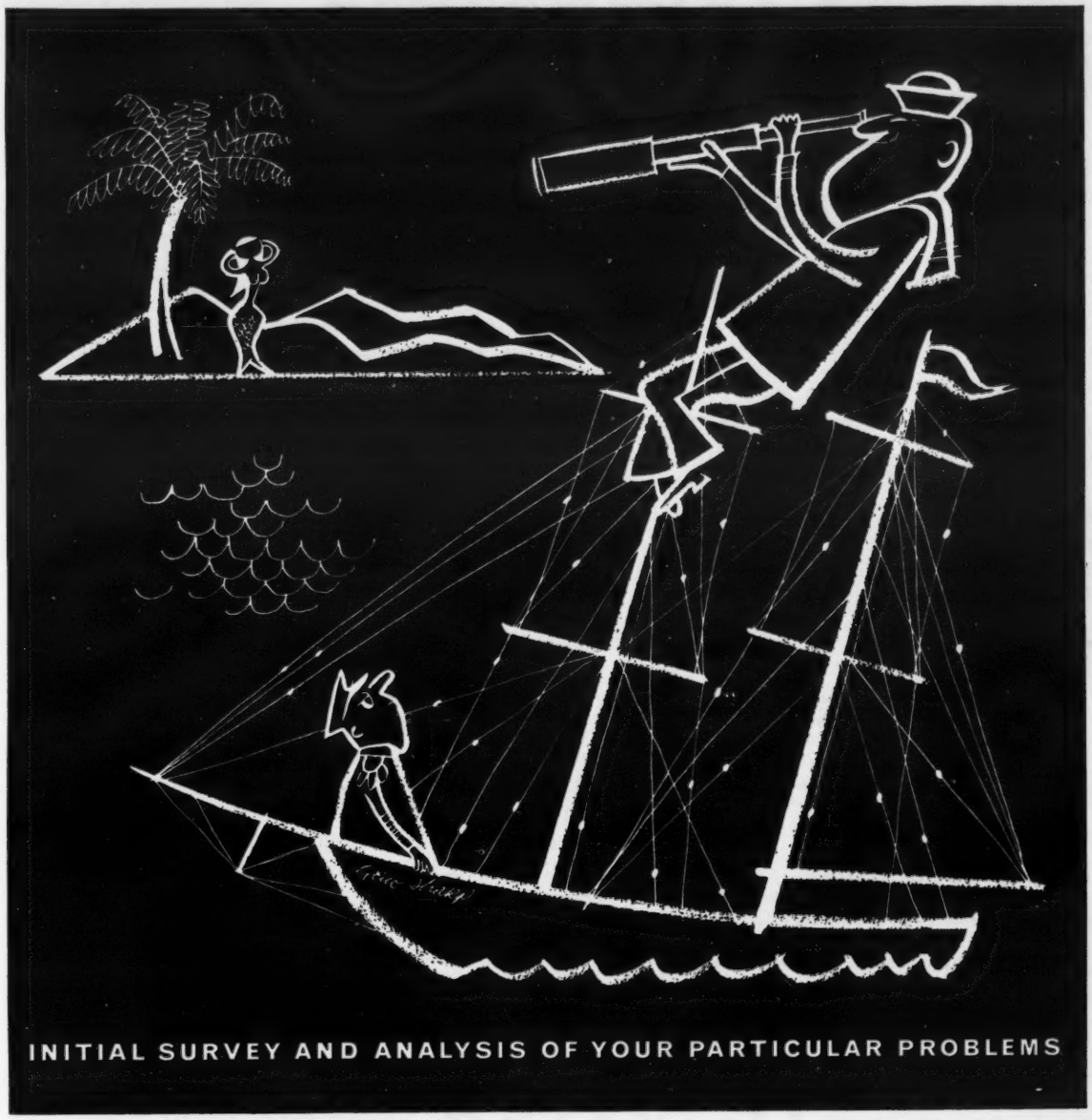

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COSMETIC

. . . is a new cosmetic grade sodium lauryl sulfate manufactured by Raymond Laboratories, Inc., 20-year specialists in cosmetic chemistry. The lightest colored sodium lauryl sulfate known, Pendit WA COSMETIC for the first time guarantees built-in uniformity. Nowhere else can you get the same viscosity, the same degree of emulsification, and the stability—batch after batch—without detergent variation problems that necessitate constant formula correction. Practically water-white, Pendit WA COSMETIC is essentially iron free and has a low salt content. Neutral and stable, continuing tests demonstrate unvarying results from lot to lot.

Pendit WA COSMETIC performs admirably as a detergent and emulsifying agent. Extensively used in the preparation of liquid and paste cream shampoos, versatile Pendit WA COSMETIC is also used in shaving creams, dishwashing compositions, car washes, personal cleansing components, and in emulsion polymerization. Pendit WA COSMETIC is shipped in 55-gal. plastic-lined, non-returnable drums and in tank trucks in three viscosity grades: low, medium and high.

Raymond

IS ALSO A NEW SOURCE FOR THESE COSMETIC GRADE RAW MATERIALS:

PENDIT® CA

—a quaternary ammonium compound (stearyldimethylbenzylammonium chloride) manufactured specifically for use in creme rinses and emulsions of unvarying physical properties.

"DITHIO"-FREE THIOGLYCOLIC ACID

—"Thio" and its salts produced for use in permanent waving lotions are completely free of the oxidation product dithiodiglycolic acid so detrimental to the permanent waving process.

REMEMBER Raymond NOTHING NEW BUT THE NAME

COMPLETE FORMULATION INFORMATION AVAILABLE. WRITE FOR SAMPLES AND LITERATURE

Raymond
LABORATORIES, INC.
267 East Fifth, St. Paul 1, Minnesota

®Pendit is a registered trade-mark of Raymond Laboratories, Inc.

When inquiring check CP 5133 opposite last page

Freon Refrigerants

(*Continued from preceding page*)

Brine cooled to −15 and to 0°C is also used for MVA production as well as for the other two steps in the neoprene process. In next step, MVA is reacted with HCl to form chloroprene (chloro buta diene). This is polymerized to produce neoprene.

All synthetic rubbers other than neoprene are isolated from latex by a precipitation process that gives rubber in crumb form, which is both difficult and messy to handle. In the freezing process, the latex emulsion (polymer dispersed in water), is frozen. On freezing the polymer coagulates into a film in such a way that it can be drawn off the freeze rolls as a continuous thin sheet, rather than in crumbs as in the precipitation process. This film is then washed and dried, and then passes to the roper.

Freeze method for manufacturing neoprene — which is only made possible by refrigeration — gives a process which can be engineered into a continuous material handling and processing system. Resultant economy and efficiency are evident. Refrigeration system at Louisville is tailored to neoprene process requirements which needs an extremely flexible refrigeration system built around the use of a multistage refrigerant.

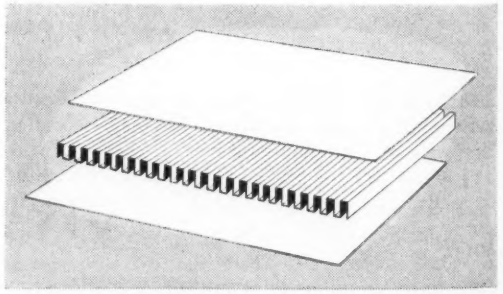
(Freon fluorinated refrigerants are product of Organic Chemicals Dept., E. I. duPont deNemours & Co., Dept. CP, Wilmington, Del. . . . or for more information check CP 5134 on form opp. last page.)

(Industrial refrigeration system at DuPont was designed and engineered by Carrier Corp., Dept. CP, 300 S. Geddes St., Syracuse 1, N.Y. . . . or for more information check CP 5135 on form opp. last page.)

✦ ✦ ✦

Heat Exchangers

(*Continued from page* 11)



Drawing shows core construction of heat exchanger

Setup permits pure nitrogen to be passed through out-of-service exchanger to derime it — clearing out accumulated solid CO_2. *Switchover from one exchanger to the other is relatively easy,* it has been

found necessary to switch exchangers to clear out dry ice every two weeks, and sometimes oftener.

All of these heat exchange units are designed with a "stacked" construction. Formed aluminum sheets can direct fluids co-currently, counter-currently or cross-currently. At Memphis, 1/8-inch serrated fins 0.010 inches thick are used. Each passage of these counterflow units is sealed by formed channels, with openings provided for entrance and exit of the stream. After entering, stream is distributed to the heat transfer surface through a section five inches long. An identical collector section picks up the stream after the pass.

For this installation, each switch exchanger has a total transfer surface (both streams) of about 30,000 square feet. Units weigh three tons.

In performance tests of the units before installation they were found to stand a 600 psi hydrostatic test. Helium leak tests under vacuum proved out, too. To meet specs, these exchangers were proved to produce less than 5°F temperature difference between streams entering and leaving the cold end.

(Plant engineering was done by Foster Wheeler Corp., Dept. CP, 165 Broadway, New York, N.Y.)

(Heat Exchangers were furnished and designed by The Trane Co., Dept. CP, La Crosse, Wisconsin . . . or check CP 5136 on form opposite last page.)

✦ ✦ ✦

WANTED:

BUDDING

CARTOONISTS!

CHEMICAL PROCESSING is in the market for cartoons (and cartoon ideas). They should touch on some aspect of chemical plant or lab work.

***Worth $10*—Cartoons in black ink on 8½ x 11" sheets—ready to reproduce—will be bought for $10, paid on acceptance.**

***Worth $5*—Cartoon *ideas* . . . a written description or rough sketch of scene, and a caption . . . worth $5, on acceptance.**

Send your gag material to:

Cartoon Editor, CHEMICAL PROCESSING
111 East Delaware Place
Chicago 11, Illinois

Be sure to include your name, position, company, and address.

What has beer in common with **your** product?

If your process operations involve the possibility of product contamination or equipment corrosion, consider how a famous Milwaukee brewer solved a similar problem. The answer was five double walled tubs and cookers of 180 and 340 barrel capacities made entirely of stainless steel and built to strict code specifications.

Chicago Steel Tank was selected to fabricate this job because it was one of the first in the field to begin working with these useful but difficult alloys. They have a wealth of experience and the most modern facilities for proper handling of aluminum, stainless steel and other alloys. You can depend on Chicago Steel Tank Company to fabricate your job exactly to specifications.

Pressure vessels, atmospheric tanks or special equipment for corrosives or food products, built from suitable alloys to your specifications—these are jobs we know how to do. If you use process equipment or if you engineer equipment for the process industries, call on Chicago Steel Tank Company to fabricate it for you.

Write for booklet which illustrates and describes Chicago Steel Tank products.

Fabricators and erectors since 1899
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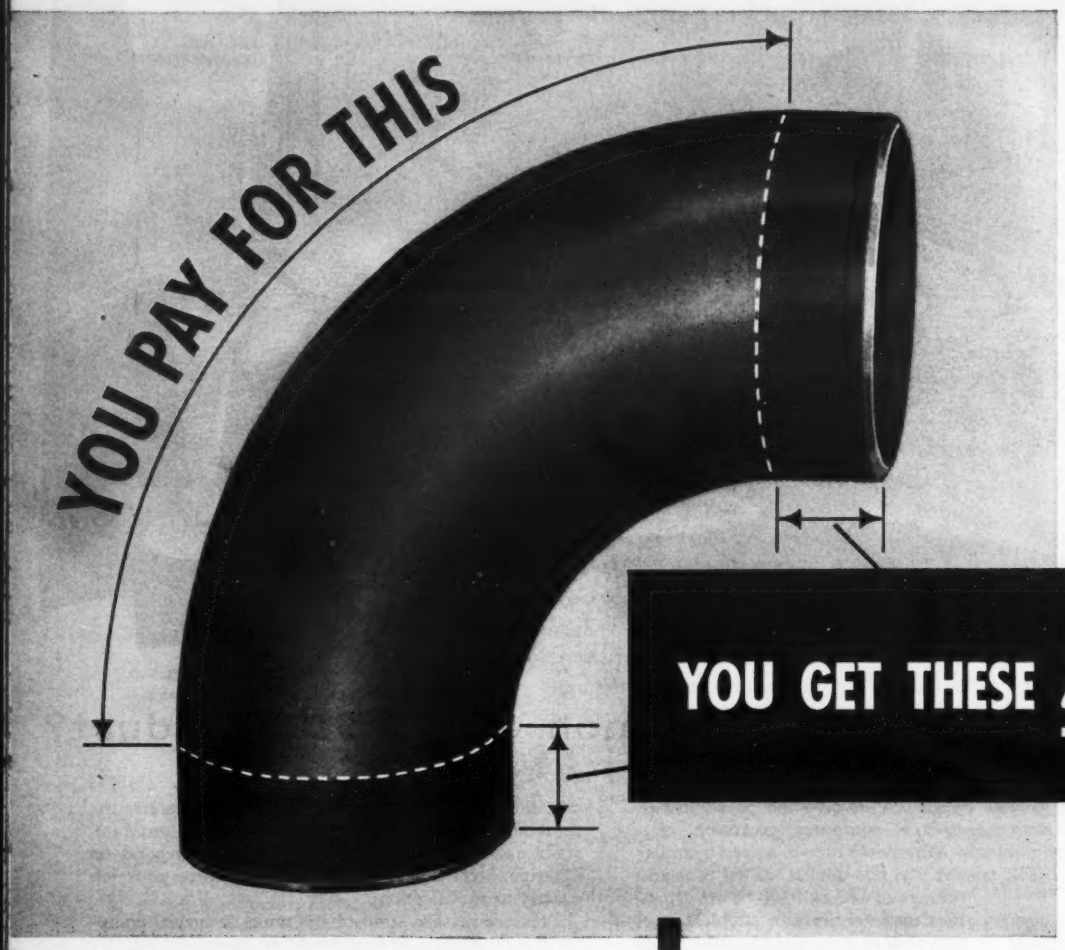
When inquiring check CP 5137 opposite last page

MIDWEST "LONG TANGENT" ELBOWS



In no other welding elbow do you get this "bonus" of long tangents. The dotted lines show where standard elbows end. Each shaded straight end equals ¼ of the nominal fitting diameter . . . a 12″ Midwest "Long Tangent" Elbow has tangents 3″ long. As a result of the advantages listed at the right, substantial savings are made on many piping systems by using Midwest "Long Tangent" Elbows . . . which cost no more than other elbows. For further information, write for Catalog 54.

MIDWEST PIPING COMPANY, INC.
Main Office: 1450 South Second Street, St. Louis 4, Mo.
Plants: St. Louis, Clifton, N. J. and Los Angeles

Sales Offices:
New York 7—50 Church St. • Chicago 3—79 West Monroe St.
Boston 27—426 First St. • Los Angeles 33—520 Anderson St.
Houston 2—1213 Capitol Ave. • Tulsa 3—224 Wright Bldg.
Cleveland 14—616 St. Clair Ave. • Miami 34—2103 Le Jeune Rd.
STOCKING DISTRIBUTORS IN PRINCIPAL CITIES

ADVANTAGES OF MIDWEST "LONG TANGENT" ELBOWS

★ **They save pipe.**

★ **They often eliminate short nipples and their extra welds.**

★ **They save time and money in lining up and clamping pipe and fitting.**

★ **They make it easier to apply slip-on flanges.**

★ **They remove the circumferential weld from point of maximum stress and can be sleeved.**

★ **THEY COST NO MORE THAN OTHER ELBOWS**

MIDWEST HAS THE MOST COMPLETE LINE

7325

MIDWEST WELDING FITTINGS IMPROVE PIPING DESIGN AND REDUCE COSTS

No special equipment needed to solder Al, stainless, glass, and ceramics . . .

grinding wheel and solder all that is necessary

A method has been developed for joining "impossible-to-solder" materials such as aluminum, stainless steel, glass, and ceramics. No special equipment is required. All that is needed are conventional soldering materials and a hand grinder with an abrasive wheel.

Grinder is turned on and the abrasive wheel (previously preheated by flame or by grinding metal) is brought to bear on a soft solder such as Wood's metal or 60-40 lead-tin. The solder melts and flows onto surface of wheel, "loading" it (this also makes wheel useless for its customary purpose until it has been trimmed down). Wheel is then applied to surface to be soldered until a slight amount of abrasion has taken place. Heat of friction again melts the solder, causing it to flow onto the freshly abraded surface and form an intimate contact.

After this tinning operation, soldering is done in conventional manner with standard 50-50 lead-tin solder. Other surface is given same treatment if it is a material not ordinarily "wetted" by solder. No soldering flux, surface cleaning, or pretreatment is used.

When working with such materials as soft glass, Pyrex-brand glass, and ceramics, best tinning is accomplished with mixture of Wood's metal and 50-50 indium-tin. When soldering glass to glass or ceramics to ceramics, it is necessary to use flame or furnace heating to get enough heat to surfaces to be joined.

(Soldering techniques are developed by Joseph C. McGuire, Los Alamos Scientific Laboratory of the University of California, Dept. CP, Los Alamos, New Mexico.)

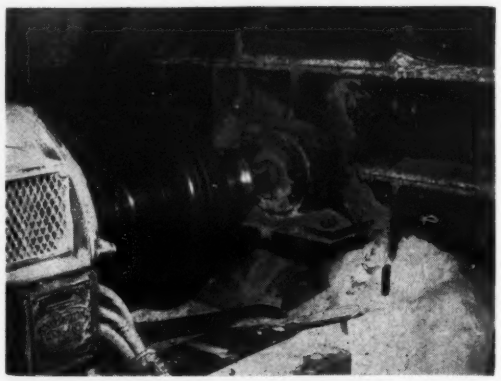
For more information on product at left, specify CP 5138 . . . see information request blank opposite last page.

Eliminates crusher damage from locked motor torque caused by overload . . .

Shawinigan saves $3000 yearly maintenance bill with fluid coupling between crusher and drive

Problem: Maintenance costs on a secondary crusher, handling 30 to 90 tons of carbide per hour, at Shawinigan Chemical Co's Carbide Division plant, Quebec, Canada, ran as high as $3000 per year. Uneven loading at times pulled 100 hp motor to a stall condition delivering locked motor torque to crusher. Most damage was caused by this condition. In addition it was impossible to start motor in normal manner when crusher was loaded. Starting current often went up to, and stayed at, 600 amps for 5 to 10 minutes after starting.

Solution: In October of 1953 Shawinigan installed a fluid coupling between crusher and motor, a 100 hp, 1200 rpm, 550v, three phase, normal torque, AC unit. Coupling transmits power



Coupling has allowed crusher to give continuous service since installed in 1953

smoothly from drive to load. Severe shock loads are eliminated. On overload, fluid in coupling slips, absorbing shocks and preventing motor from pulling down.

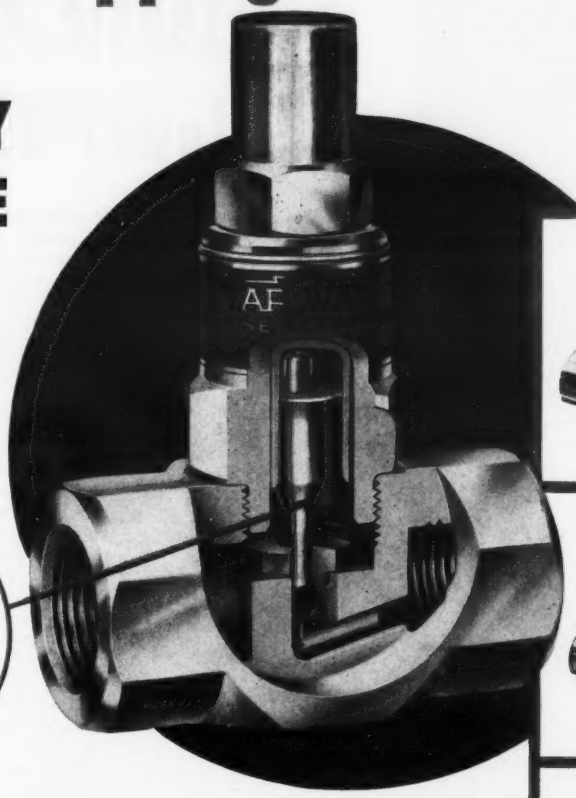
Results: Since installation of coupling no repairs or maintenance have been necessary. Unit has been in continuous service. Starting current reaches 600 amps for only a fraction of a second then drops to 80 amps and motor may be started normally.

(Model 21" HCS fluid coupling was supplied by Twin Disc Clutch Co., Dept. CP, 1361 Racine St., Racine, Wis. Check CP 5139 opposite last page.)

This month's Processing and Engineering Data section starts on page 216

the impulse that revolutionized steam trapping

YARWAY IMPULSE STEAM TRAP



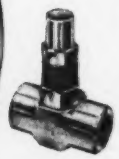
the only moving part

. . . a small stainless steel valve that literally floats on the condensate load. Gets equipment *hot in a hurry*—and *keeps it hot!*

SERIES 60 and 120

For all *normal* trap requirements, pressures to 400 and 600 psi.

½" No. 20-A

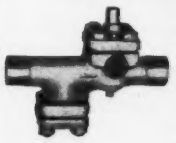


For *light loads* on tracer lines, steam mains, small presses, etc.

SERIES 40

For *heavy loads* requiring extra high capacity steam traps.

INTEGRAL-STRAINER HIGH PRESSURE TRAP



For *high pressures, high temperatures.* (Flanged or welding connections.)

Twenty years ago YARWAY applied a unique theory of thermodynamics to steam traps—and gave industry the amazing YARWAY Impulse Steam Trap.

Today — over a million YARWAY Impulse Steam Traps later — advantages like the following continue to convert new users, and convince old users to standardize on the YARWAY Impulse:

- **QUICK HEAT-UP AND EVEN TEMPERATURES OF EQUIPMENT**
- **GOOD FOR ALL PRESSURES WITHOUT CHANGE OF VALVE OR SEAT**
- **SMALL SIZE—LIGHT WEIGHT**
- **ONLY ONE MOVING PART**
- **STAINLESS STEEL—minimum maintenance**
- **WON'T FREEZE UP**
- **A COMPLETE LINE of sizes and types for every requirement**
- **IMMEDIATELY AVAILABLE from 270 local Industrial Distributors**

For free Trap Selector, or 24 page Bulletin, write

YARNALL-WARING COMPANY
125 Mermaid Avenue, Philadelphia 18, Pa.

YARWAY **IMPULSE® STEAM TRAP**

OVER 1,000,000 YARWAY IMPULSE STEAM TRAPS USED

When inquiring check CP 5140 opposite last page

with VISKON® filter fabric YOU can Lower Unit Cost!

- ✔ ***VISKON Cuts Downtime:*** **Filter cake practically falls off VISKON due to fabric's unique smooth surface. Takes only seconds to clean by merely scraping or low pressure hosing.**
- ✔ ***VISKON Increases Production:*** **Frequent shut-downs are eliminated. Filter cycles increase as much as 35% due to longer continuous line flow.**
- ✔ ***VISKON Reduces Cost of Filter Medium:*** **This filter fabric is so inexpensive it can be thrown away after a one-time use or can be quickly cleaned and reused. Eliminates the laundering of costly filter cloths.**
- ✔ ***VISKON Has High Flow Rate:*** **Special bonding prevents filter cake from becoming enmeshed in the fibers. This permits high flows with low pressure drop.**
- ✔ ***VISKON Achieves Clearer Filtrate:*** **Diatomaceous earth will not pass through VISKON.**
- ✔ ***VISKON Has Excellent Wet Strength.***
- ✔ ***VISKON Withstands Normal Filtering Temperatures And Pressure.***

"Less Downtime – More Production!"

Cutting per unit cost of operation is the challenge of every plant engineer in America. That's why VISKON Filter Fabric is used more and more throughout the country.

Because of its many unique features, VISKON is proving in plant after plant that it can cut downtime ... step up production ... give you clearer filtrate.

We invite you to investigate VISKON—the modern filter fabric. Let our engineers answer your specific questions. See for yourself the many advantages of filtering with VISKON—make a trial run in your own plant.

MAIL THIS COUPON NOW

Or Write Your Letter of Inquiry To:
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P. O. Box 72 • North Little Rock, Arkansas

Name_____
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City_____ Zone____ State_____
Type of Filter Press_____

see our catalog in S PLANT ENGINEERING FILE or write for copy

VISKON® nonwoven fabrics

When inquiring check CP 5141 opposite last page

NEW SOLUTIONS of processing problems

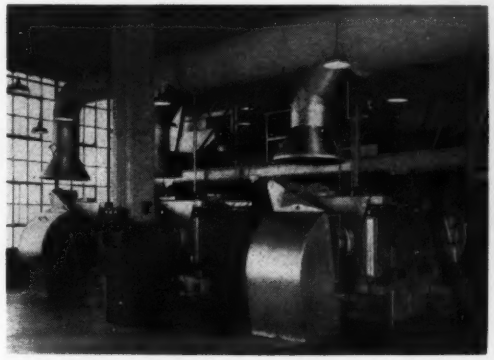
Goodyear Tire speeds production, saves labor, with combination mill-strainers . . .

old equipment replaced, new machines can each handle 8000 lb rubber stock per hour

Problem: A faster and more economical way to mix, plasticize, and strain reclaimed rubber was sought by engineers at The Goodyear Tire Company, Akron, Ohio. Existing method was slow, tedious, and required considerable labor and equipment. Manual transferring of stock from machine to machine took time and handicapped production. Mills and strainers were getting old and needed considerable maintenance to keep going.

Here's how the old method worked: 1) stock was placed on apron mill and worked, while necessary ingredients as oil, pigments, etc. were being added; 2) stock was removed from mill and passed through preliminary refiner; 3) stock was strained; and 4) stock was processed on the finish refiners.

Solution: Company replaced the old apron mills and strainers with three combination units known as "Mil-Strainers". Machines actually combine steps 1) and 3) — plasticizing and straining



Machines have 12"-diameter rotating screw powered by 400-hp motor

— into one operation. Powered by a 400-hp motor, the operation is performed inside the unit by a 12"-diameter rotating screw. Each machine is capable of handling about 8000 lb stock per hour and operates on a 24-hour basis.

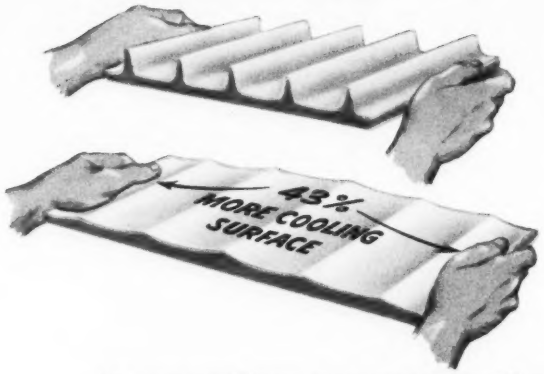
De-vulcanized, dried rubber is automatically fed in crumb form to a ribbon blender located over the Mil-Strainer where the various ingredients are added and pre-blended. A short connecting bin between overhead conveyor trough and feed hop-

(Please turn to page 27)

For more information on motors advertised at right specify CP 5142 . . . see information request blank opposite last page.

There's MORE *Cooling Surface* with Allis-Chalmers MOTORS

Why Rib-Type Motors Won't Fry



STRETCH OUT RIB DESIGN of Allis-Chalmers motors and see the greater cooling area provided — as much as 43% on many models. Insulation won't fry under normal conditions with deep-rib construction because every rib adds to the heat-dissipating surfaces. The result—moderate overloads can be taken in stride with little fear of burnouts.

As a new machinery component or as replacement, specify Allis-Chalmers. To find out more, contact your nearby A-C district office, distributor, or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

A-C ALLIS-CHALMERS

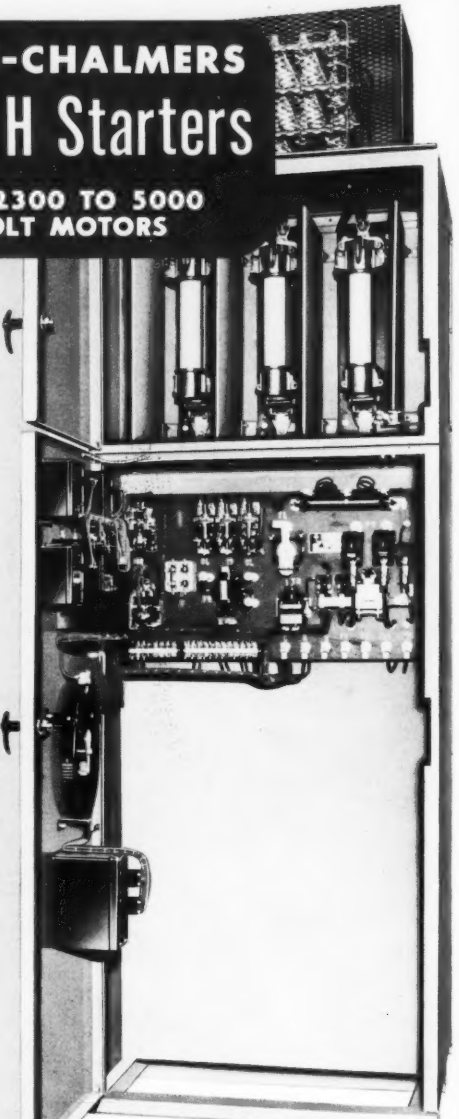
A-4882

CHOICE of CONTACTORS

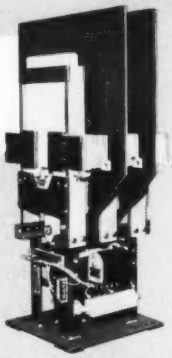
to meet your specific needs

Allis-Chalmers Type H Starters may be equipped with either air-break or oil-immersed contactors — installed in the same sized space.

ALLIS-CHALMERS
Type H Starters
FOR 2300 TO 5000 VOLT MOTORS

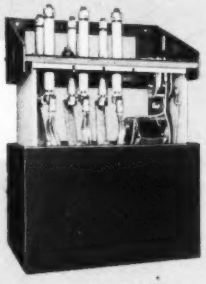


AIR



Designed for top performance on the rough-tough jobs. Advantage of contacts operating in air include long contact life, reduced fire hazard, easy maintenance. Double-break contacts, vertical action and dual blowouts provide long, dependable operation. Design simplicity makes contactor particularly adaptable for applications requiring frequent starting, inching, reversing, or dynamic braking.

OIL



Meets operating demands of semi-hazardous locations. Contactor operates under oil to prevent sparks from igniting atmosphere and to protect mechanism from corrosion. Contactor is time-proved clapper type. Self-cleaning, rolling-wiping action extends contact life. Self-aligning E-type magnet provides perfect armature seating . . . quiet, maintenance-free operation.

YOU GET MORE...

Allis-Chalmers offers help on specific control application problems. Call your Allis-Chalmers representative. His recommendations are backed by Allis-Chalmers engineering departments . . . by the experience gained in solving thousands of control problems . . . by complete research and testing facilities.

For complete information on the Type H starter, write for Bulletin 14B6410B — Allis-Chalmers, General Products Div., Milwaukee 1, Wis.

A-C ALLIS-CHALMERS

ALLIS-CHALMERS

A-4976

(*Continued from page* 26)

per houses two magnets which catch any loose metal particles that may be in the stock. A gate is used to regulate amount of stock going into hopper. Hinged door above mouth of hopper serves for visual inspection of feed hopper section.

Machines have quick-opening NRM strainer head, which not only gives additional length to mixing barrel, but also permits screen changes in a very minimum of time. Flared head on screw provides uniform pressure over entire screen area assuring constant flow, and eliminating possibility of stagnant or other contaminated stock collecting in head area.

Cutting mechanism is of the single-blade type driven by a gear-head motor. It is running continuously in one direction or, if desired, rotation can be reversed after so many revolutions, after which cycle repeats itself. Strained product leaving machines is carried by conveyor system to refiners.

Results: Placed into operation in 1953, machines have given even better service than originally anticipated. Chief advantage is savings in labor. About 20% of the area personnel have been released for work in other departments. Other advantages include: 1) improved, more uniform product; and 2) increased production.

(NRM Mil-Strainers are product of National Rubber Machinery Company, Dept. CP, 47 West Exchange Street, Akron 8, Ohio . . . or for more information check CP 5143 opposite last page.)

Globe valve outlives 10 others in severe steam service — still going strong . . .

opened, closed 11,000-15,000 times a yr; Brinalloy seat, disc show no sign of wear

Problem: Outdoor utility steam hose station at Wyandotte Chemical Corporation, Wyandotte, Michigan, had been taking its toll of throttling valves for years. The pipe shop superintendent estimates that some 50 globe valves had been used and replaced on the line in 20 years.

Located at the base of an ash tower, and buried below grade in loose gravel and finely-ground ashes, with its stem projecting to pick up grit, the valve is subjected to severe punishment. The steam

(*Please turn to next page*)

For more information on contactors at left, specify CP 5144 . . . see information request blank opposite last page.

FOR FAST, SAFE BARGE LOADING

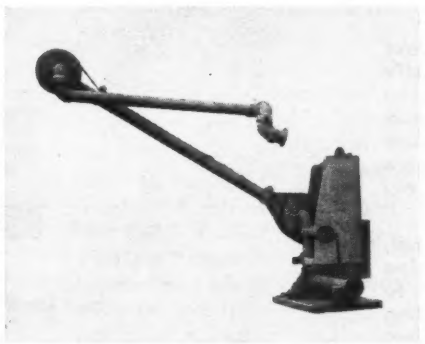
Clear the docks!

New CHIKSAN

BARGE LOADING ARM

SAVES ON

Line Handling Injuries
Dock Clutter
Lengthy Hookup Time
Hose Bursts
Replacement Costs



This newly developed barge loading arm ends hazardous manhandling of loading hoses, eliminates dangerous dock clutter. Mechanical operation makes hookup fast and simple . . . one man can handle the job in minutes with no physical strain.

Ball bearing swivel joints make it possible to rotate the arm to meet varying flange locations. After arm is flanged to barge riser, it can be left unattended. Arm will automatically conform to the various positions of the barge as loading or unloading is carried out. When not in use the operation arm can be raised up and out of dockside traffic.

Write For Illustrated Literature, Dept. 13-5

CHIKSAN

A SUBSIDIARY OF FOOD MACHINERY AND CHEMICAL CORPORATION fmc

CHIKSAN COMPANY — BREA, CALIFORNIA • CHICAGO 5, ILLINOIS • NEWARK 2, NEW JERSEY

Well Equipment Mfg. Corp. (Division) Houston 1, Texas • Chiksan Export Company • Chiksan of Canada, Ltd., Edmonton, Alta.

When inquiring check CP 5145 opposite last page

GIVES YOU BEST *Performance*

Because it's Best Suited to the Job

WELDCO Always Meets Your *Specifications*

TO GET TOP-QUALITY PIPE and TUBING made to your individual needs, it's always good business to specify Weldco. For Weldco is produced by specialists—men who have the equipment, facilities and experience to manufacture pipe and tubing to your exact specifications. And only Weldco is automatically welded with the exclusive Double-Fusion process! Then it's carefully finished, accurately sized, and rigidly inspected.

Weldco is available in Stainless Steel, Monel, Inconel, Nickel, Cupro-Nickel, and Hastelloy, in tube and pipe sizes from 3" to 30", Schedules 5 and 10, and 3" to 12", Schedule 40. To insure top performance and long service life, make Youngstown Welding your tubing headquarters. A letter or phone call puts our 40 years of specialized experience to work for you.

Whatever Your Needs In Tubing... You're Way Ahead With WELDCO

THE YOUNGSTOWN WELDING & ENGINEERING CO.
3712 OAKWOOD AVE. · YOUNGSTOWN 9, OHIO

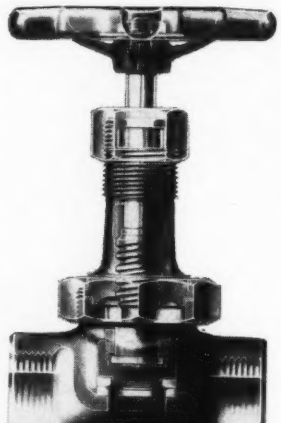
When inquiring check CP 5146 opposite last page

(*Continued from preceding page*)

Valve is installed below grade, in loose gravel and finely-ground ashes

hose gets year-round use for cleaning grease from gears and machinery, removing ice from trucks and hoists, and other general-purpose uses by millwrights who are located nearby. It is estimated that the valve is opened and closed an average of 11,000-15,000 times a year.

Solution: In March, 1952, a ¾" experimental globe valve was installed, as part of tests conducted by valve manufacturer in cooperation with a number of companies. Big feature of valve is that the seat and disc are made of Brinalloy — a patented alloy with a hardness rating of 600 Brinell. It is reported to be more durable than 500 Brinell stainless steel and to outwear special case-hardened stainless steel exceeding 1000 Brinell. Tests show it to have top resistance to wire drawing, wear, and erosion.



Phantom view of valve. Brinalloy seat and disc eliminate leakage, resist erosion

Valve's seating surfaces are small. This reduces chances of trapping dirt or solids between the faces as they close. The mirror-smooth hard surfaces, in closing, crush trapped particles. Steam or other line fluids continue to flush through until metal meets metal and the tight seal is effected. Body of the valve is made of close-grained dense bronze metal. Valve is now in full production in sizes from ¼" to 2".

Results: In operation over three years, the valve has served without trouble, and is still in

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Zonolite vermiculite is the remarkable mineral with many unique characteristics of interest to research men, designers, and product developers. New book describes chemical and physical properties. Countless uses, including:

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- Insulation of liquid air storage vessels
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Zonolite vermiculite, readily available from our 40 plants is a granular crystalline mineral of low density. Possesses high thermal and absorptive properties, and is available in a *wide* range of particle sizes. Send today for free book and inspection sample.

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☐ Please send me my free copy of your ready-reference book, "Zonolite Vermiculite Chemical and Physical Properties."
☐ Please send sample of processed vermiculite.
Name_____
Firm_____
Address_____
City_____ Zone____ State____

When inquiring check CP 5147 opposite last page

use. It has already outlived 10 other valves and when removed for inspection showed no sign of wear on the Brinalloy seat and disc.

(LQ600 valves are manufactured by The Lunkenheimer Company, Dept. CP, Beekman, Waverly, and Tremont Streets, Cincinnati 14, Ohio . . . or for more information check CP 5148 opp. last page.)

Test kits available for Cr diffusion process

Laboratory test kits for diffusing chromium into small pieces of ordinary steel, giving them the surface characteristics of stainless steel, are being offered to interested parties. The stainless surface alloys are reported not to chip, crack, peel, or gall even when stretched, twisted, or bent 180°.

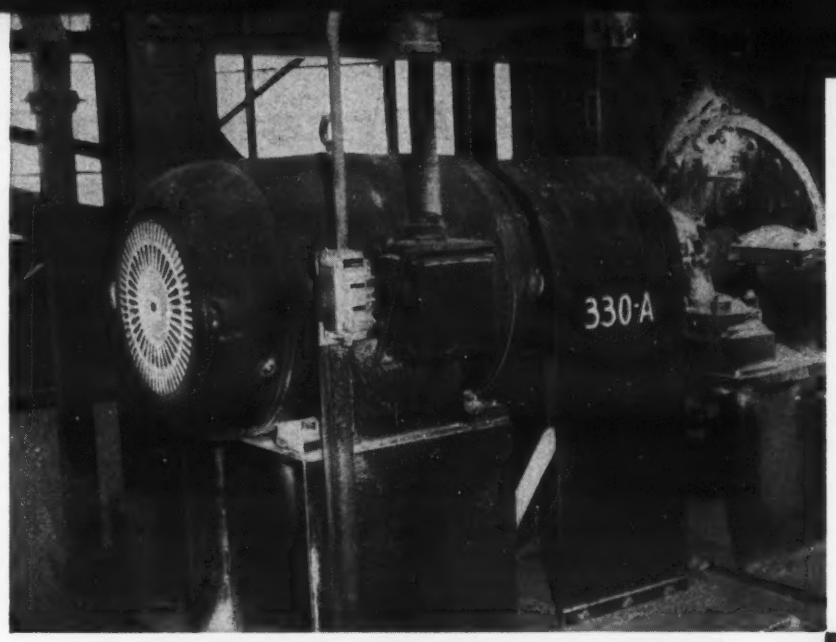
Process does not cause appreciable dimensional changes other than those obtained during normal heat treatment of the parent metal. After processing, products may be heat treated in conventional manner. They can also be brazed, arc welded, or spot welded.

Three kits are available — each tailored to a particular range of steel. They are identified as: 1) "Kromko", for low-carbon steel from A1S1 1008 to 1025; 2) "Metfuse", for medium-carbon steel from A1S1 1030 to 1050 (also for alloyed medium-carbon steel having similar carbon content range); 3) "Ardlast", for high-carbon steel from A1S1 1055 to 1095 and for tool steels (except high-speed).

Same operating procedures used with kits are used in actual production.

(Laboratory test kits are offered by Alloy Surfaces Co., Dept. CP, 1115 N. 38th St., Philadelphia 4, Pa. Check CP 5149 opp. last page.)

For more information on product at right, specify CP 5150 . . . see information request blank opposite last page.



WHERE DUST PREVAILS—A 60 hp, 1160 rpm Wagner motor drives this pulverizer which grinds down oversize fertilizer. Its totally-enclosed construction keeps fertilizer dust out and mechanical and electrical stability in.

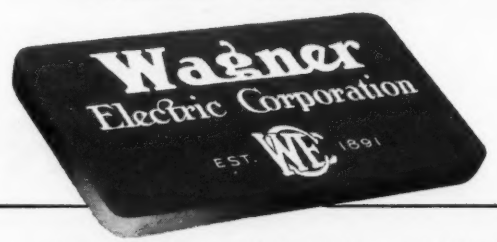
Wagner Standard Motors do specialized jobs at Missouri fertilizer plant

The Missouri Farmers Association has its own fertilizer plant in Joplin, Missouri. Technically, it is called a "high analysis granulating unit." Principal chemical compounds manufactured are phosphoric acid and ammonium phosphates. With an annual capacity of 70,000 tons of fertilizer, this farmer-owned plant is one of two of its kind in North America.

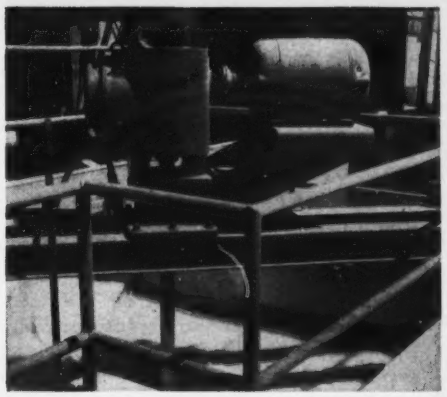
In this plant, designed by the Dorr Company and built by Merritt-Chapman and Scott Corporation, you'll find more than 100 standard Wagner totally-enclosed motors providing the power for pulverizers, grinders, blowers, conveyors and pumps, operating under adverse conditions—where open-type motors would quickly fail.

Whether it's a job of producing plant food or any of hundreds of other industrial operations . . . Wagner Standard Motors can do the job reliably, economically and well. Wagner engineers are qualified to specify the correct motors for *your* requirements. Consult the nearest of our 32 branch offices—or write for Bulletins MU-132 and MU-203.

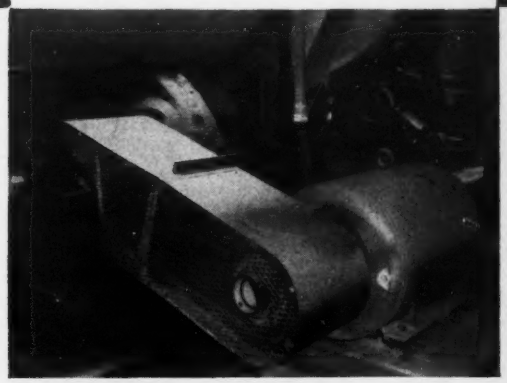
Wagner Electric Corporation
6359 Plymouth Ave. • St. Louis 14, Mo., U.S.A.



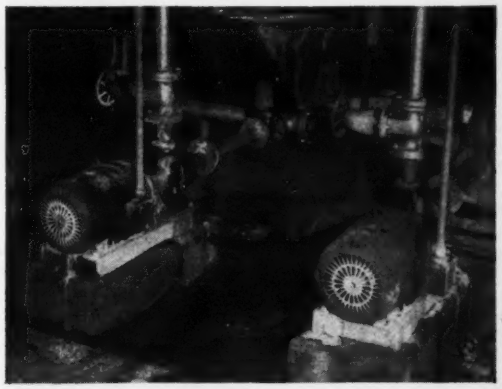
WH56-3



PERMITS OUTDOOR OPERATION—This Wagner 15 hp, totally-enclosed, fan-cooled motor drives an agitator which mixes hydrated lime with plant water. This motor's totally-enclosed, corrosion-resistant, cast-iron construction protects it from the elements and keeps it always "on the job."



AT REDUCED SPEED—In this application, a 100 hp, 1160 rpm Wagner motor drives a Rotary Fertilizer Drier at 5 rpm through a Falk Motoreducer.



IN CORROSIVE ATMOSPHERE—These 5 hp, 3500 rpm Wagner motors drive pumps that handle 93% sulphuric acid. But even sulphuric acid is no deterrent to the reliable operation of these motors because of their corrosion-resistant cast-iron frames and totally-enclosed construction.

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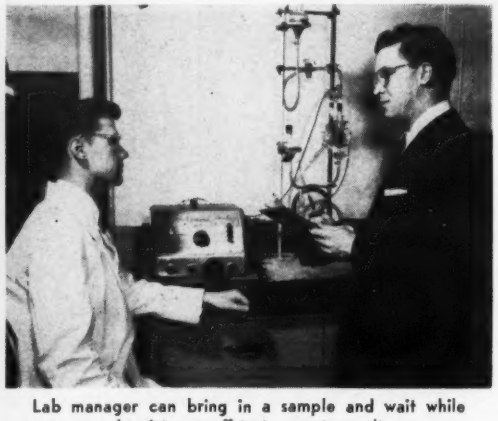
ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL BRAKES • AUTOMOTIVE BRAKE SYSTEMS – AIR AND HYDRAULIC

Analyze gasoline for TEL in 40 min . . .

accurate test supplements eight-hour ASTM standard for quality control work

Problem: Central Regional Laboratory of Du Pont's Petroleum Chemicals Division runs routine analyses of gasoline for tetraethyl lead content. Standard ASTM method for this determination (D526) calls for extraction of TEL, and several additional steps necessary before precipitation of the lead as lead chromate which is determined gravimetrically. *Procedure takes about eight hours.*

Solution: To get faster results, the lab switched to a polarographic method. Micro-electroplating of metal on falling drops of mercury is used with an electrical instrument to make precise measurements. Method hinges on holding voltage at the critical level to plate out lead. When this condition is met, diffusion current is directly proportional to the amount of lead in solution.



Lab manager can bring in a sample and wait while chemist runs off test, reports results

Several variables affect the proportionality, however, and a standard for comparison is needed. To meet this requirement, "pilot ions" of cadmium are added to the sample in known concentration. The ratio of cadmium current (at cadmium's characteristic voltage) to lead current then accurately reflects amount of lead.

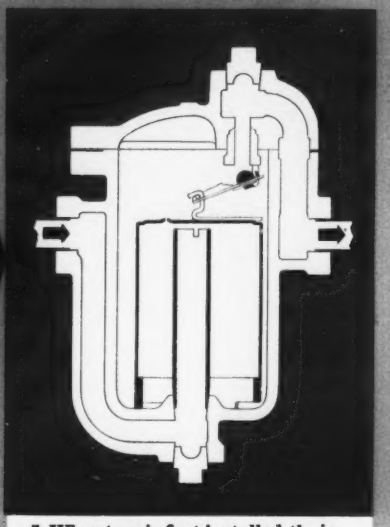
To make determination still more convenient, instrument measures these two currents, compares them, and reports lead content directly in milliliters of tetraethyl lead per gallon of gasoline.

Results: Test time has been reduced from eight hours to about 40 minutes. Accuracy and precision have been found equivalent to the gravimetric method.

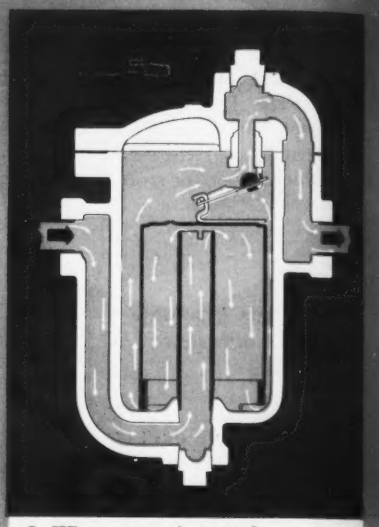
(TEL meter is a product of Fisher Scientific Co., Dept. CP, 717 Forbes St., Pittsburgh 19, Pa. . . . or reader may simply check CP 5151 on form which is located opposite last page.)

How Armstrong Trap Design

Picture of PROFITABLE TRAP PERFORMANCE



1. When trap is first installed, the inverted bucket is down and the valve is wide open. The large clearance between valve and seat minimizes restriction to condensate flow, contributing to large capacity.

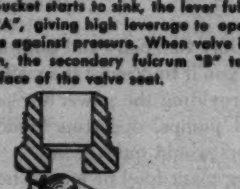


2. When steam is turned on, note how condensate (solid color) flows down between bucket and trap body, then up and out through orifice. Dirt is held in suspension and washed out when valve opens.

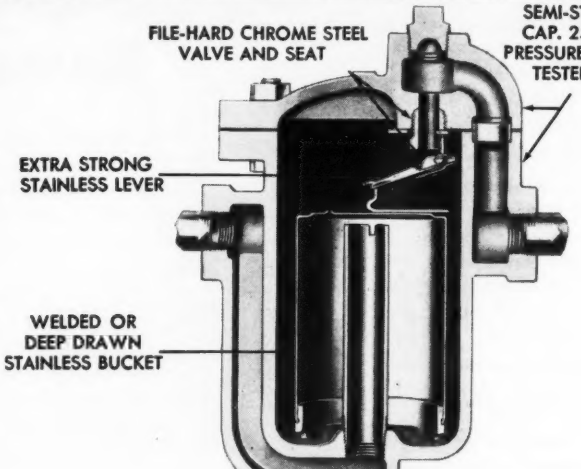
Two-Phase Leverage Provides High Capacity for Trap Size

Valve in closed position.

As bucket starts to sink, the lever fulcrums at "A", giving high leverage to open the valve against pressure. When valve is well open, the secondary fulcrum "B" touches the face of the valve seat.



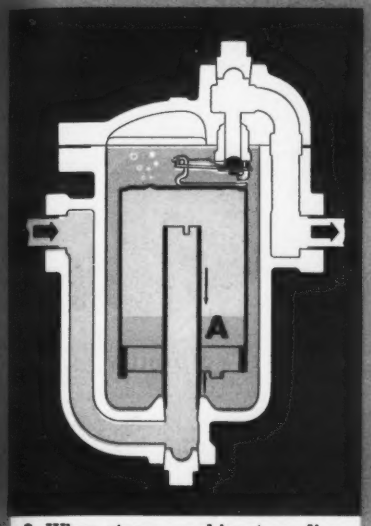
Additional bucket travel results in fulcrum "B" becoming the pivot, permitting the valve to be opened wider so that restriction to flow of condensate is minimized.


FILE-HARD CHROME STEEL VALVE AND SEAT
SEMI-STEEL BODY AND CAP. 250 LBS. DESIGN PRESSURE—HYDROSTATIC TESTED AT 500 LBS.
EXTRA STRONG STAINLESS LEVER
WELDED OR DEEP DRAWN STAINLESS BUCKET

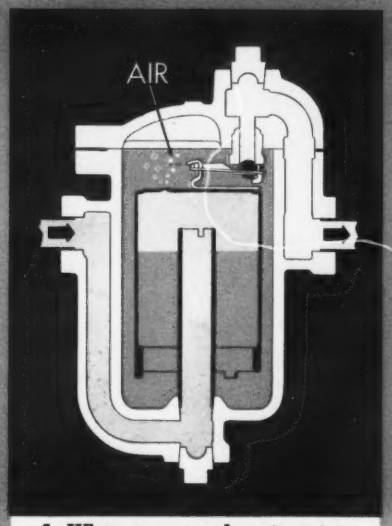
Look at this trap. Only two moving parts. It's non-clogging, non-sticking, made of corrosion resistant materials. It will provide trouble-free service for years and years.

ARMSTRONG Inverted

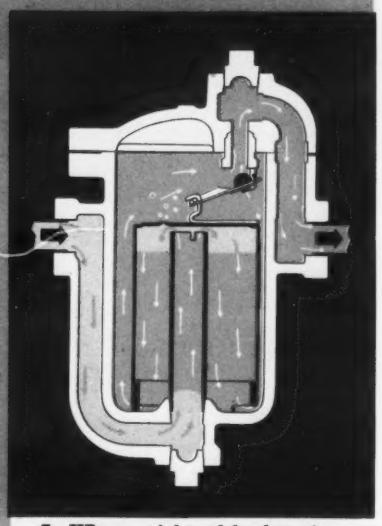
Improves Plant Efficiency . . .



3. When steam reaching trap displaces less than ¾ of the water in the bucket, it floats, closing the valve. Generous safety margin (dimension A) insures that steam will never reach trap orifice.



4. When more condensate enters trap, the bucket loses buoyancy and pulls on valve lever. (Note how incoming air passes through bucket vent and collects at top of trap, awaiting discharge.)



5. When weight of bucket times leverage overcomes pressure on valve, trap opens, creating momentary pressure drop that "pumps" condensate and non condensibles from unit being drained.

Time-Tested Inverted Bucket Principle Provides Five Cost-Reducing Benefits:

"The bucket is upside down!" they cried, when Adam Armstrong marketed his first steam trap in 1911. Well, it is still upside down and it is the most widely used and most widely imitated trap for draining process equipment in the world today. The reason is simple—the basic principle has stood the test of time against all others on every type of application.

The modern Armstrong Trap is unsurpassed in these five major contributions to plant operating efficiency:

1. Fast heat-up—thanks to large condensate and air handling capacity. On batch or cycled production, you get maximum output per day.

2. High heat transfer rate—quick opening creates a sudden surge of condensate and air from the unit being drained. This pumping action prevents stratification of incondensibles and insures complete drainage. Laboratory and field tests prove it produces higher heat transfer than is otherwise possible.

3. Low Fuel Consumption—non-productive radiation losses are minimized because condensate is discharged at steam temperature as fast as it accumulates in the trap—you get more production per hour and per unit of fuel. And, there is no steam loss through the trap orifice.

4. Continuity of operation—the trap always opens for condensate; the simple, sturdy, self-cleaning mechanism insures continuous operation between inspections without interruption of processing.

5. Low Maintenance — no trap has ever gained so enviable a record for trouble-free service—ask anyone who has kept records.

Free: Steam Trap Book—
44 helpful pages on trap selection, installation maintenance, physical data and prices. Call your local Armstrong Representative or Distributor, or write:

ARMSTRONG MACHINE WORKS
880 Maple Street, Three Rivers, Michigan

Bucket STEAM TRAPS

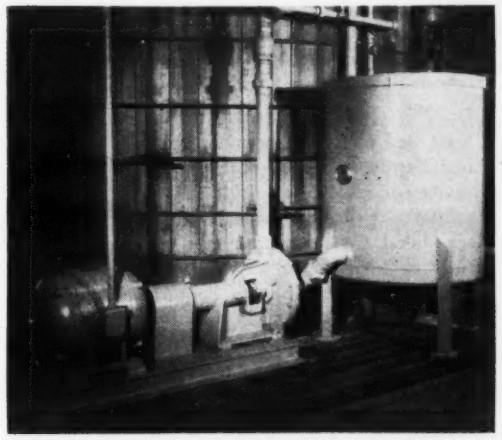
When inquiring check CP 5152 opposite last page

Conserve scarce water supply with recirculating system at Norwich Pharmacal . . .

side-suction centrifugal pump speeds flow of cooling water for minimum temp gain

Problem: Adequate cooling for expanding production involving temperature sensitive reactions, and a well already supplying cooling water at close to capacity with no reserve, were the elements of a dilemma confronting Norwich Pharmacal Company at their Norwich, N.Y. plant. Several parts of various processes, particularly in the manufacture of Furacin, an anti-bacteria compound used for dressing burns, required continuous cooling to a constant temperature in order to maintain high product quality.

Solution: Standard cooling on Furacin reaction system, which used 90 gallons per minute of fresh well water, was replaced in 1953 by a recirculating continuous cooling system. Installation includes a side-suction centrifugal pump and a fresh water supply tank. Water is pumped speedily through cooling lines and returned to tank with



Side suction centrifugal pump and fresh water supply tank in continuous cooling system at Norwich

only a slight rise in temperature. A self-acting temperature flow valve opens a tap, supplying fresh cool water to maintain required water temperature. Excess water empties from tank through an overflow. System overflow rate is ten gallons per minute.

Results: Recirculating system has reduced amount of fresh well water required in Furacin process by 115,000 gallons per day. Similar systems have been installed on three reactors in Furoxone plant, on acetic acid recovery plant, and aspirin reactor jackets. It is now possible to maintain a well water reserve with all units operating.

(Side suction centrifugal pump is a product of Deming Co., Dept. CP, 522 Broadway, Salem, Ohio. Check CP 5153 opposite last page.)

Bacterial oxidation system solves water problem at Sun Oil . . .

permits re-use of waste waters in existing cooling systems

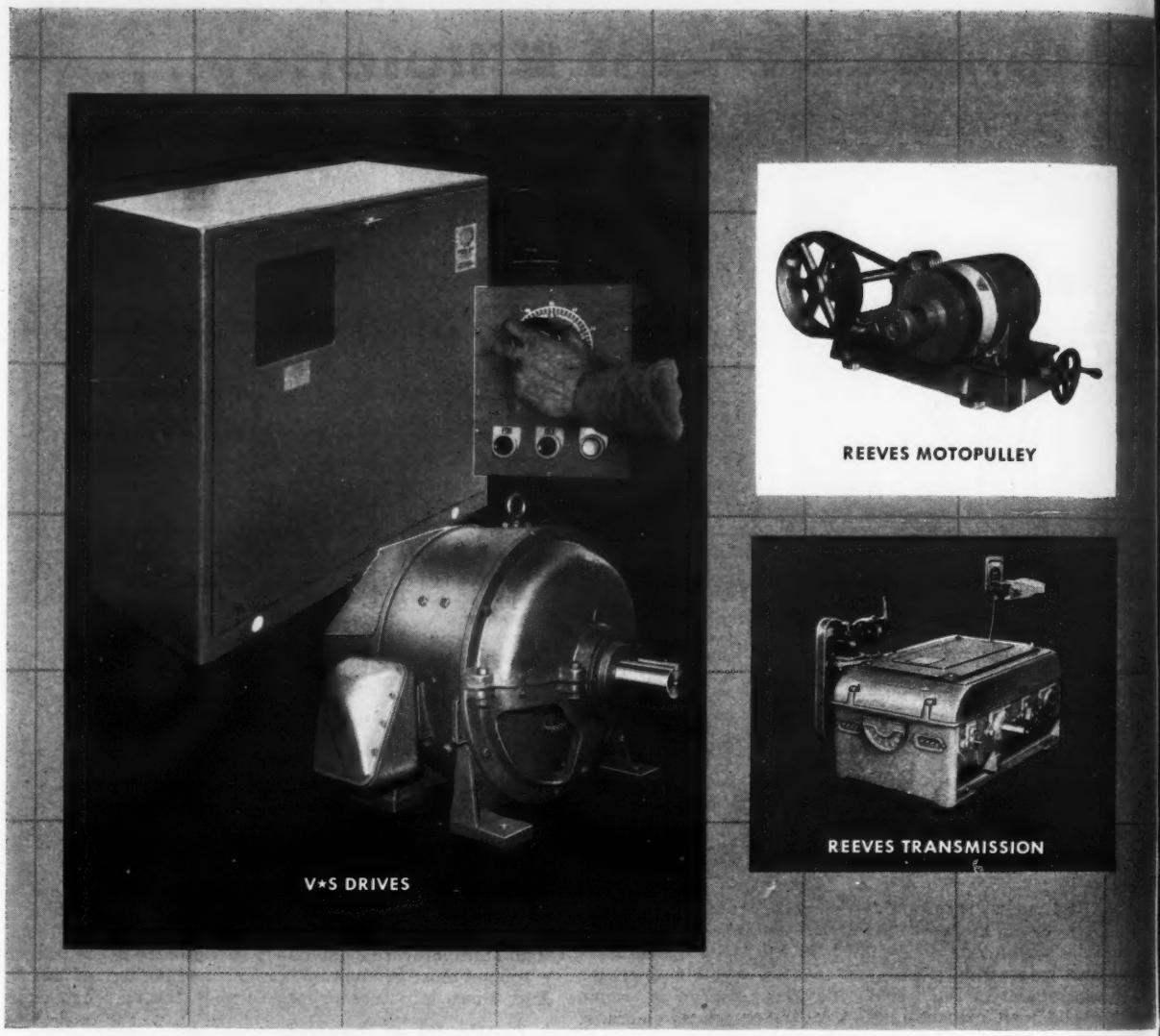
Problem: Possible water shortage problem confronted Sun Oil Company during the expansion of their Toledo, Ohio, refinery. Raw water supply line from the Maumee River, two miles away, was already over-taxed. City water was in use, but higher costs were anticipated and the availability of an increased supply was questionable. Problem was further complicated by the fact that the existing waste water treating facilities were not adequate enough to handle any increased amounts.

Solution: Based on experience previously gained with chemical and bacteriological waste treatment procedures, engineers installed a modified bacterial oxidation system which would permit them to re-use refinery waste waters in their existing cooling tower systems.

First step in the program was the installation of a flue gas stripping tower for removing sulfides from refinery process waste waters scheduled for re-use. Sulfides interfere with biological activity and cause corrosion in cooling equipment. Second phase consisted of complete segregation of all the plant waste water as to type and characteristics.

An impounding basin, 1200x200x-10′, with a capacity of eight million gallons, was built to provide storage, equalizing, removal of residual oil, and preliminary biological treatment. Two 1250-gpm diesel-driven pumps were mounted at the basin to provide emergency fire protection and to augment plant's existing pumping capacity.

Low-alkalinity waste water from refinery operations, together with contaminated storm water from ground run-off, are drained through plant's original sewer system and API separator for primary removal of oil and settleable solids, prior to impounding. Two 750-gpm pumps are installed at the basin to return the low-alkalinity process and



● WIDENING THE HORIZONS OF

R

Automation is the key to greater production of more goods and services at lower cost. The Tools of Automation can be applied profitably in a countless number of individual industries.

Reliance can provide *you* with valuable engineering assistance which can help secure the advantages of automation.

Our Tools of Automation consist of electric motors, variable-speed drives and controls.

RELIANCE

storm water to refinery cooling towers. Water is returned as make-up with no pre-treatment other than gravity separation and impounding for five to eight days.

Oil-free waste water, high in alkalinity and not suitable for re-use, is disposed of as waste. Oil-bearing, high-alkalinity water, is collected in new sewer system, passed through an auxiliary separator for oil removal, and is then discharged to waste stream.

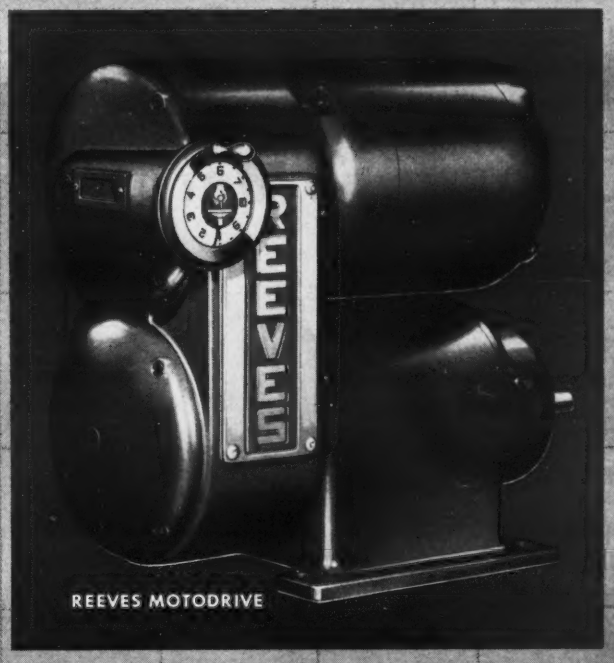
Results: Completion of four-month test period for re-use system gave even better results than were originally expected. Phenol content in the re-use water consistently has been reduced over 99% beginning with the first day of operation, and chemical oxygen demand has been substantially lowered. Presence of bacterial sludge was noted within several hours after injection of phenolic-bearing waste water, although the system was not seeded with phenol-consuming organisms. The bacteria are probably naturally airborne and water-borne.

There has been no adverse effect on heat-transfer efficiency of tubular cooling equipment with the re-use water. Only small quantities of acid have been required to reduce alkalinity in the make-up water.

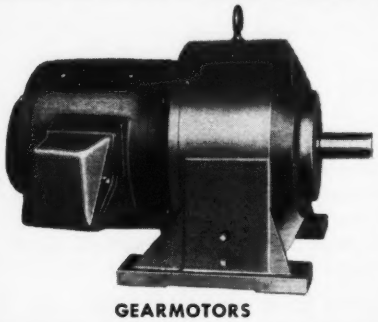
As a result of the satisfactory test period, system is being extended to other cooling towers in the refinery, and pumping capacity is being increased to return all re-usable water to the tower systems. Upon completion, it is anticipated that the entire refinery pollution load will be substantially reduced, and the economic value of the re-use water will rapidly amortize initial investment of the new segregating and collecting facilities.

(Condensed from paper prepared by Mr. Harold F. Elkin, Sanitary Engineer, Sun Oil Co., Dept. CP, 1608 Walnut Street, Philadelphia 3, Pennsylvania.)

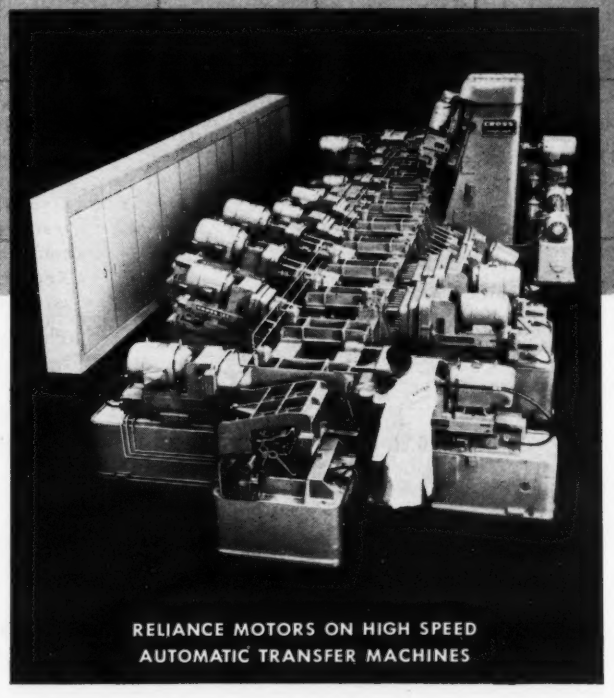
TOTALLY-PROTECTED MOTORS



REEVES MOTODRIVE



GEARMOTORS



RELIANCE MOTORS ON HIGH SPEED AUTOMATIC TRANSFER MACHINES

AUTOMATION

Application of these tools ranges from a single motor to multi-motor drives for highly complex production lines, where materials are processed into finished products in one continuous operation.

The world's largest manufacturer devoted exclusively to the production of quality motors and drives is ready to help you widen the horizons of automation in your plant.

Bulletin No. A-1555-B gives further details.

A-1519

ELECTRIC AND ENGINEERING CO.

DEPT. 145A, CLEVELAND 10, OHIO

Canadian Division: Welland, Ontario • Reeves Division: Columbus, Indiana

Sales Offices and Distributors in Principal Cities

For more information on product at left, specify CP 5154 . . . see information request blank opposite last page.

Activated carbon granules

which can be reactivated economically —

promise savings in decolorization

Although originally designed for cane sugar liquor refining, carbon should find use in other applications

PITTSBURGH TYPE CAL GRANULAR CARBON

Physical Properties

Apparent density (bulk density, dense packing, gm/cc)	0.44
Particle density (Hg displacement, gm/cc)	0.7
Real density (He displacement, gm/cc)	2.1
Pore volume (within particle, cc/gm)	0.94
Voids in dense packed column (%)	38
Specific heat (at 100° C)	0.25
Total surface area (N_2 BET method, M^2/gm)	1000-1100

Specifications

Mesh size, US sieve series	12 x 40
Larger than 12 mesh (max %)	5
Smaller than 40 mesh (max %)	5
Mean particle diameter (mm)	0.90-1.10
Iodine number (min)	1000
Molasses number (min)	230
Ash (max %)	8.5
Moisture as packed (max %)	2.0
Abrasion number (min)	75

USES: Granular carbon was developed specifically for decolorization of all cane sugar liquors, including clarified, filtered raws, remelts, and affination syrup. However, it should find other uses in applications where bone char or vegetable carbon are now being used for decolorizing.

Features: Carbon comes in granular form. Its exceptional decolorizing properties permit filtering cycles of 20 to 30 days, or longer, before the carbon needs regeneration. This can be done economically: less than 0.7 lb/100 lb melt has to be reactivated. Ratio can be reduced if carbon is used countercurrently on successively darker liquors. Regenerated carbon has its original activity and specific gravity.

This carbon requires relatively simple equipment. In a bone char refinery, the standard bone filters can be used without modification. Because of the long filtering cycles, char house capacity should increase. In a refinery using powdered vegetable carbon, carbon steel columns would be installed. Conversion costs should be paid for by accrued savings within two years. For example, a one million lb/day melt refinery converting from pulverized vegetable carbon could save about $100,000 in carbon makeup cost in 350 operating days.

Since filters need only be sweetened-off once in three or four weeks (instead of every two or three days) and reactivation requirements are greatly reduced, there are also substantial savings in steam, power, and fuel in comparison with bone char decolorizing.

Description: Type CAL Carbon is made from certain grades of bituminous coal by closely controlled high-temperature steam activation. Physical

Granular carbon and cane sugar lumps — refining with carbon makes it white

properties and specs are given in the accompanying table. The carbon is designed for use in large fixed beds, in 20-ft deep columns 5-10 ft in diameter. Liquor flow rates of 0.5 gal/min/sq ft of cross-sectional bed area give excellent results in down-flow operation.

Operating temperatures and Brix (concentration) are kept at normal levels. There is no pressure drop problem. For example, with a 63.5 Brix sugar liquor at 170°F flowing at 0.5 gal/min/sq ft of bed area, pressure drop through a 20-ft depth is only 5-10 psi.

In applications where inversion cannot be tolerated, about 5-10% (by wt) of granular dead-burned magnesite (sintered MgO) can be intimately mixed with the carbon before it is charged. This mixture can be regenerated without loss of activity.

As mentioned, thermal regeneration brings the carbon back to its original activity and density, cycle after cycle. In refineries having a daily melt of one to three million pounds per day, reactivation can be carried out in a direct-fired rotary kiln of 36-54 inches diameter and 20-30 ft long. In larger refineries, a multiple-hearth Herreshoff furnace would prove economical.

Revivification takes place by oxidation of impurities, not distillation as with bone char — hence the savings in fuel costs. Regeneration temperature is about 1400-1500°. Carbon loss on regeneration averages about 4-5% per cycle.

(Type CAL Carbon is a product of Activated Carbon Div., Pittsburgh Coke & Chemical Co., Dept. CP, Grant Bldg., Pittsburgh 19, Pa. . . . or for more information check CP 5155 on form opposite last page.)

The Best

Now even Better

Oronite Alkane

by the world's largest producer of synthetic detergent raw materials

Oronite's continuous multi-million dollar research and product development program scores again with Alkane '56, embodying still further improvements in the leading detergent raw material. Better than ever Alkane '56 may be sulfonated by any conventional method—products derived from it have an even lighter color, less odor—with a very minimum oil content.

If you are considering sulfonation, it will pay you to check with Oronite. We have the experience, plus engineering and manufacturing specialists to accurately estimate your complete needs for sulfonation. Plant designs, equipment needs and prices, performance data, yields—everything you need to know.

Whether you require the top quality detergent raw material or help on sulfonation processes, contact the Oronite office nearest you. Our wide experience is at your disposal.

Other Oronite Detergent Products

Detergent Slurry
Detergent D-40
Detergent D-60
Dispersant NI-W
Dispersant NI-O
Dispersant NI-E
Wetting Agent "S"

ORONITE CHEMICAL COMPANY

EXECUTIVE OFFICES: 200 Bush Street, San Francisco 20, California

SALES OFFICES

450 Mission Street, San Francisco 5, Calif.
30 Rockefeller Plaza, New York 20, N. Y.
Carew Tower, Cincinnati 2, Ohio
714 W. Olympic Blvd., Los Angeles 15, Calif.
20 North Wacker Drive, Chicago 6, Illinois
Mercantile Securities Bldg., Dallas 1, Texas
36 Avenue William-Favre, Geneva, Switzerland

ORONITE CHEMICAL COMPANY

When inquiring check CP 5156 opposite last page

HOW *HERCULES* HELPS...

MULTICOLOR APPEAL—More than 1,000,000 square feet of exterior and interior surfaces of the new Los Angeles Beverly Hilton Hotel have been decorated with single-spray applications of "Zolatone," Paramount Paint & Lacquer Company's multicolor lacquer*. Based on Hercules® nitrocellulose, multicolor lacquers are a fast-drying, economical, and durable decorative finish.

*U.S.Patent No. 2,591,904, held by Coloramic Coatings, Inc., Los Angeles.

A PRODUCTION LINE PROBLEM, excessive foam can destroy quality control in the manufacture of paper, synthetic rubber, and other products. A 2½ pound brick of convenient, easy-to-handle Hercules® Defoamer 4, however, can make as much as 40 gallons of highly effective foam control solution. Send for free testing sample.

A NEW SOURCE OF SUPPLY for acetone has been created by Hercules' Gibbstown, N. J. oxychemical plant. From photographic film to nail polish, from paints and lacquers to acetate rayon, acetone plays a vital production role as a solvent.

HERCULES POWDER COMPANY
INCORPORATED
940 Market St., Wilmington 99, Del. Sales Offices in Principal Cities
SYNTHETIC RESINS, CELLULOSE PRODUCTS, CHEMICAL COTTON, TERPENE CHEMICALS, ROSIN AND ROSIN DERIVATIVES, CHLORINATED PRODUCTS, OXYCHEMICALS, EXPLOSIVES, AND OTHER CHEMICAL PROCESSING MATERIALS

655-10(8)

HERCULES
CHEMICAL MATERIALS FOR INDUSTRY

When inquiring check CP 5157 opposite last page

Increases abrasion resistance when used with paper, textiles, or rubber . . .

dispersion made from Type 8 nylon resin is bonding, coating, and finishing agent

Uses: As a bonding, coating, and finishing agent for textile, paper, and rubber industries.

Features: With non-woven fabrics, dispersion's adhesive strength increases strength and flexibility and improves laundering and dry cleaning properties. It adds abrasion resistance and tensile strength to woven or knitted fabrics. Agent is permeable to moisture vapor.

In paper industry, dispersion increases wet and dry strength, especially with synthetic fiber papers. As a coating, it increases abrasion resistance and adds vapor permeability characteristics that are required in some packaging materials. Agent also acts as a petroleum barrier.

Applied as a coating to rubber, dispersion increases abrasion resistance and shows promise as a petroleum barrier. The dispersion resists heat and curing damage if it is used as an adhesive.

Description: Dispersion is made from Type 8 nylon resin under license from E.I. du Pont de Nemours & Co. (Inc.). It can be applied by dip coating, by roller, or by spraying with either a heat sealable thermoplastic or thermoset finish.

(BCI Nylon Dispersion is a product of Belding Corticelli Industries, Inc., a sub. of Belding Heminway Co., Dept. CP, 350 Fifth Ave., New York 1, N.Y. Check CP 5158 opposite last page.)

"Selection of the proper coupling agent was a beautiful example of theoretical deduction. . ."

Thanks to John Eberbach out Tulsa, Oklahoma, way for this cartoon. John is an organic chemist in the Dowell Inc. research labs.

Chromatographic reagent for copper analysis announced

Uses: As a reagent for spot tests, colorimetric methods of analysis, and paper chromatography.

Features: Compound is an extremely sensitive reagent for copper. Identification at a limiting concentration of 0.4 ppm has been reported.

Description: Dithiooxamide, is orange-red to dark orange crystalline powder. A complexing agent, it reacts with a number of metallic ions to form colored, insoluble rubeanates.

(Acid Rubeanic AR reagent is a product of Mallinckrodt Chemical Works, Dept. CP, 2nd & Mallinckrodt St., St. Louis 7, Mo. . . . or for more information check CP 5159 on form which is located opposite last page.)

Heavy rare earth oxides in purities to 99.9% now available

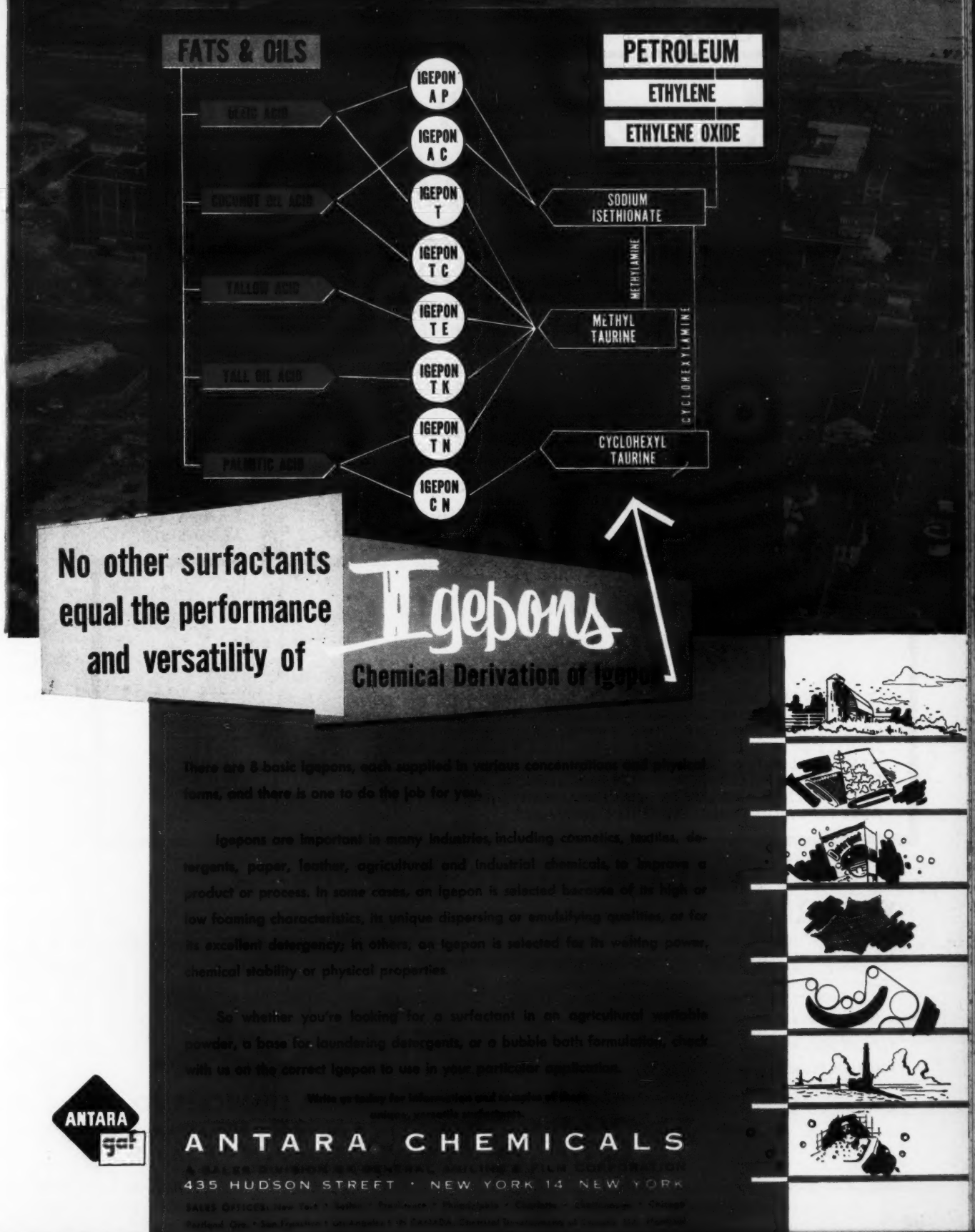
Uses: As components in carbon arc cores, optical polishing applications, and in metallurgy.

Features: Substantial quantities of heavy rare earth oxides are now available in purities up to 99.9%.

Description: Oxides are derived by ion-exchange process. Those offered are: yttrium, samarium, gadolinium, ytterbium, dysprosium, erbium, and thulium.

(Rare earth oxides are products of Rare Earths, Inc., subs of Davison Chemical Co., Div. of W.R. Grace & Co., Dept. CP, Box 488, Pompton Plains, N.J. . . . or for more information check CP 5160 on form opposite last page.)

For more information on product at right, specify CP 5161 . . . see information request blank opposite last page.


FATS & OILS
PETROLEUM
ETHYLENE
ETHYLENE OXIDE
IGEPON AP
IGEPON AC
IGEPON T
IGEPON TC
IGEPON TE
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No other surfactants equal the performance and versatility of Igepons
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There are 8 basic Igepons, each supplied in various concentrations and physical forms, and there is one to do the job for you.
Igepons are important in many industries, including cosmetics, textiles, detergents, paper, leather, agricultural and industrial chemicals, to improve a product or process. In some cases, an Igepon is selected because of its high or low foaming characteristics, its unique dispersing or emulsifying qualities, or for its excellent detergency; in others, an Igepon is selected for its wetting power, chemical stability or physical properties.
So whether you're looking for a surfactant in an agricultural wettable powder, a base for laundering detergents, or a bubble bath formulation, check with us on the correct Igepon to use in your particular application.
Write us today for information and samples of these unique, versatile surfactants.
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keeping up with **SODIUM**

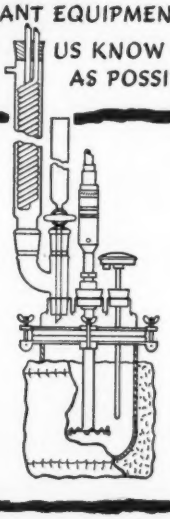
YOU CAN BORROW A PILOT UNIT FOR MAKING DISPERSIONS

NEED HELP IN SPEEDING THE PROGRESS OF YOUR SODIUM PROJECTS? JUST AS U.S.I. HELPS BY PROVIDING SAMPLES OF SODIUM DISPERSIONS FOR RESEARCH, IT CAN NOW HELP BY LOANING YOU A PILOT SIZE DISPERSION UNIT FOR YOUR NEXT STEP. THIS UNIT WILL PREPARE 3 TO 4 GALLONS OF 10 TO 20 MICRON DISPERSIONS IN LESS THAN 20 MINUTES. RESULTS WILL DUPLICATE LAB EXPERIENCE AND CAN BE SCALED UP TO PERMIT PROPER DESIGN OF PLANT EQUIPMENT.

NO OBLIGATION, BUT LET US KNOW YOUR NEEDS AS FAR IN ADVANCE AS POSSIBLE.

Prefab Dispersion Units Now Being Sold—

IF YOU WANT MILLILITERS FOR LAB EXPERIMENTS OR GALLONS FOR PILOT EVALUATION, COWLES DISSOLVER COMPANY WILL SELL YOU A PACKAGE UNIT. THESE UNITS WERE DESIGNED JOINTLY BY COWLES AND U.S.I. AFTER U.S.I. RESEARCH DEPARTMENT EVALUATED THE COWLES "DISSOLVER" AND FOUND IT AN EFFICIENT IMPELLOR FOR DISPERSING SODIUM. A DRIVE ASSEMBLY, IMPELLOR AND OTHER INDIVIDUAL PARTS ARE ALSO AVAILABLE FOR MODIFYING EXISTING EQUIPMENT.



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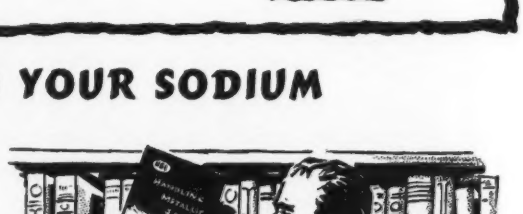
- **HANDLING METALLIC SODIUM ON A PLANT SCALE**—NEWLY REVISED U.S.I. MANUAL. 40 PAGES ON SAFE HANDLING TECHNIQUES, EQUIPMENT, USES, FORMS AND CHEMISTRY. (AVAIL. FROM U.S.I.—NO CHARGE.)
- **LIQUID-METALS HANDBOOK. SODIUM-NAK SUPPLEMENT**—JULY, 1955 BY A.E.C. AND DEPT. OF NAVY. (AVAIL. FROM SUPT. OF DOC., $2.00.)
- **SODIUM PLUMBING**—A REVIEW OF UNCLASSIFIED RESEARCH AND TECHNOLOGY FROM OAK RIDGE NATIONAL LABORATORIES. (USAEC ORNL-1688, AVAIL. FROM TECH. SERV., DEPT. OF COMMERCE, $.60.)



USTRIAL CHEMICALS CO.

Division of National Distillers Products Corporation
99 Park Avenue, New York 16, N. Y.
Branches in principal cities

When inquiring check CP 5162 opposite last page

Develops a single bath conditioner that prepares aluminum surfaces for continuous enameling . . .

eliminates multiple baths and prefiring; finished surface has good properties

Uses: As a one-step process to produce a uniform, conditioned surface on aluminum. This surface is well suited for continuous enameling. It is expected to enhance the use of colorful porcelain enameled aluminum on buildings and elsewhere.

Features: Simple and inexpensive, process does not require multiple chemical baths and a prefiring operation, formerly necessary to insure controlled surface conditions. Thus labor costs are kept low. Enameled aluminum surfaces prepared by this one-bath process resist failure in both the 5% aluminum chloride spall test (96 hr @ room temp) and in a 3½% sodium chloride alternate immersion test. Outdoor weathering tests show no failure after one and two years exposure in industrial atmospheres.

Description: Conditioning solution is composed of sulfuric acid, chromic acid, and water. Small amounts of hydrofluoric acid will reduce discoloration on surfaces of aluminum-silicon alloys. The inhibited acid bath does not produce any appreciable attack on the aluminum, nor is there any buildup of reaction products on the surface. Bath is easily maintained by periodically adding its components, as determined by chemical analysis. Rigid control, however, is not necessary.

The one-bath process has these steps:

1) Preliminary cleaning, as described below.
2) Immersion in hot conditioning solution.
3) Through rinsing in water.
4) Drying.

The purer alloys, such as 1100 and 3003, only need vapor degreasing or inhibited alkaline cleaning to remove dirt and grease. Heat-treatable alloys, such as 6053, 6061, 6062, and 6063, must be more severely cleaned because of their irregular and more complex oxide film.

(R-100 Process is covered by patents, and is licensed by Aluminum Company of America, Dept. CP, Alcoa Bldg., Pittsburgh 19, Pa. . . . or for more information check CP 5163 opp. last page.)

Find percentage of residual chlorine in bleached paper pulp — with convenient nomograph, page 218

High temp resistance given cured epoxies by catalysts . . .

liquid hardeners handle easily at room temperature

Uses: As liquid epoxy resin catalysts.

Features: Hardeners are particularly effective when high temperature resistance in a cured product is desired. They are liquid at room temperatures and offer added convenience over solid catalysts which must be heated before use.

Description: Products are based on m-phenylene diamine (Dion RP-7), and 4,4′ methylene dianiline (Dion RP-22). They can be used as general purpose catalysts if desired.

(Dion RP-7 and RP-22 are products of Chemical Process Co., Dept. CP, PO Box 829, Redwood City, Calif. . . . or for more information check CP 5164 on form opposite last page.)

Guaranteed amide content of 90% min for three surface actives

Uses: As surface-active agents.

Features: Minimum guaranteed amide content for the three products is 90%.

Description: Compounds are designated as follows: P-616, a condensate of diethanolamine and a 94% min methyl laurate; P-621, a condensate of diethanolamine and a combination of methyl laurate and myristate; P-650, a condensate of diethanolamine and whole coconut methyl esters.

(P-616, -621, and -650 are products of Stepan Chemical Co., Dept. CP, 20 N. Wacker Dr., Chicago 6, Ill. Check CP 5165 opposite last page.)

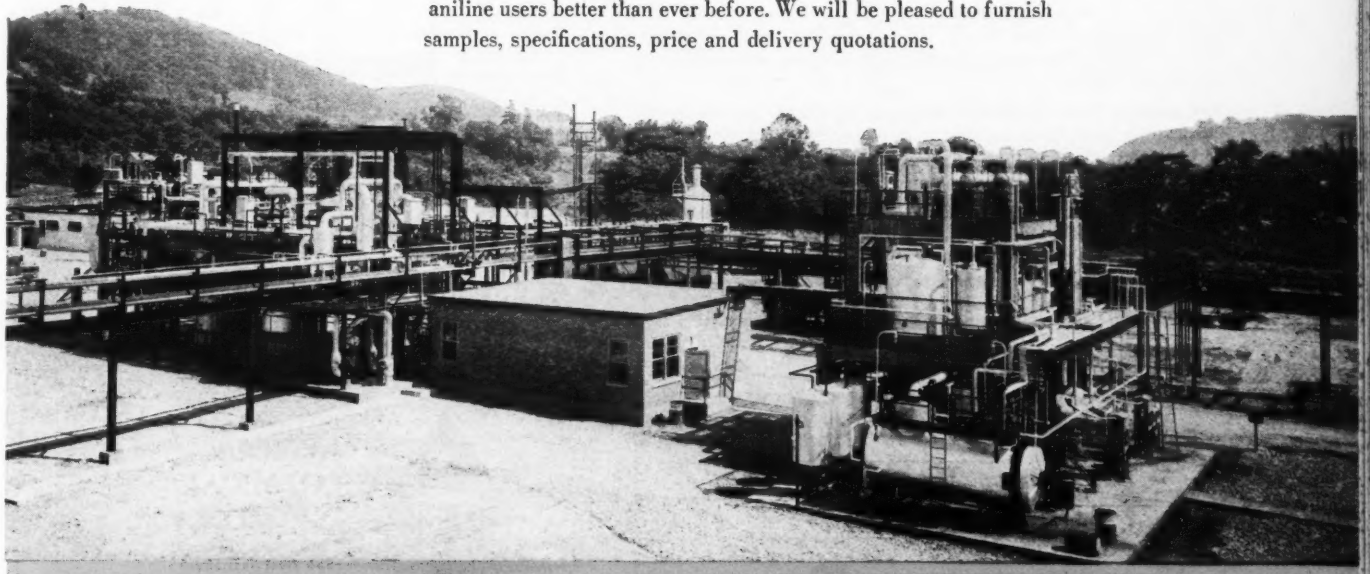
For more information on product at right, specify CP 5166 . . . see information request blank opposite last page.

this Aniline is as good as it looks

It exceeds the A.C.S. specifications for C.P. Aniline

Water white, exceptionally pure and outstandingly uniform, our Moundsville Aniline is made by a patented, continuous-hydrogenation process developed by National Aniline research. Initial output of our Moundsville plant met such a favorable reception that we doubled capacity within the year.

Now—with ample production and a strategic Ohio River location for prompt inland waterway, rail or truck delivery, we can serve aniline users better than ever before. We will be pleased to furnish samples, specifications, price and delivery quotations.



NATIONAL ANILINE DIVISION ALLIED CHEMICAL & DYE CORPORATION • 40 RECTOR ST. NEW YORK 6, N. Y.

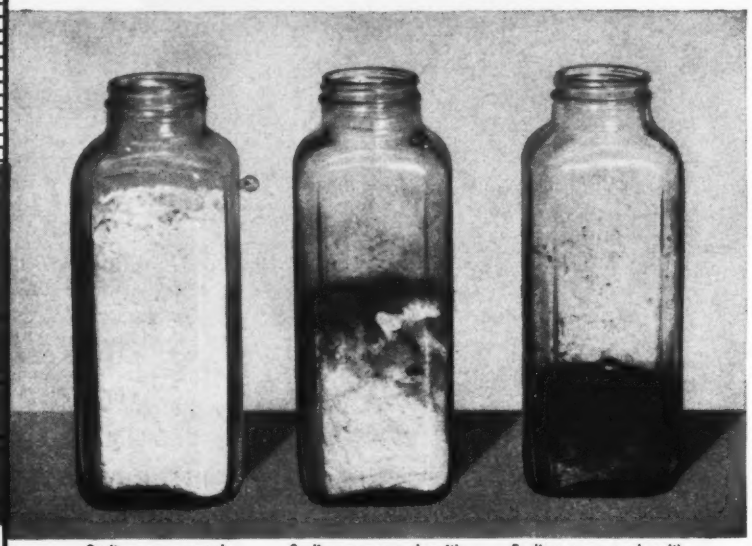
Boston Providence Philadelphia Chicago San Francisco Portland, Ore. Greensboro Charlotte Richmond Atlanta Los Angeles Columbus, Ga. New Orleans Chattanooga Cleveland Toronto

Heat at 110°—for 4 weeks—

Neo-Fat® Red Oils prove

their superior stability!

The soap made with Armour Neo-Fat Red Oil keeps its color—continues after a 4 week heat stability test to look and smell as fresh as the day it was made. The soaps made with other brands of red oil started to change color early in the test and after 4 weeks were worthless.



Sodium soap made with Armour Neo-Fat 94-04 (Red Oil).

Sodium soap made with Brand "A" Red Oil.

Sodium soap made with Brand "B" Red Oil.

In storage and during high temperature processing, tests prove conclusively that Armour Red Oils offer the greatest resistance to heat, color degradation and oxidation. This greater stability means your soaps and cosmetics will have longer shelf life, look and smell fresher in use. In lubricating, scouring or finishing textiles, this also means your textiles won't develop unpleasant odors.

This superior Armour Red Oil has low pour point, low unsaponifiable and high oleic content. It is consistently uniform in composition and quality because of strict production control and rigidly enforced specifications.

Armour's basic position in fats and oils also assures you of a constant, never-failing source of supply. For information and samples of Neo-Fat 94-04 Red Oil, simply write us listing your application or send the coupon below.

ARMOUR—your one best source for all fatty acids.

MACKEY TEST PERFORMANCE

No. of hrs. to reach 105° C.	1	2	3	4	5	6
Armour low titer Red Oil	■	■	■	■	■	■
Brand "A" Red Oil	■	■	■	■	■	
Brand "B" Red Oil	■	■	■			
Brand "C" Red Oil	■	■				
Brand "D" Red Oil	■	■				
Brand "E" Red Oil	■					

Mackey Test comparisons show Armour Red Oils have 21.2% greater oxidation stability than the next best brand. The Mackey Test measures resistance to oxidation; is based on the time required to reach 105° C.

SEND FOR FATTY ACID INFORMATION

Name_____

Firm_____

Address_____

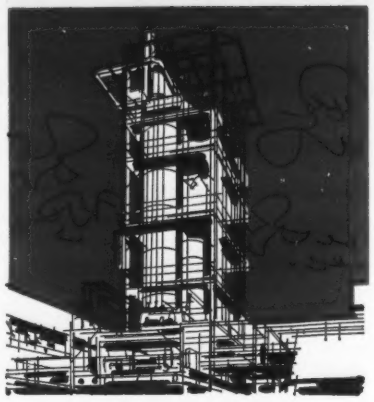
City_____ State_____

CP5

ARMOUR CHEMICAL DIVISION

© Armour and Company
1355 West 31st Street
Chicago 9, Illinois

When inquiring check CP 5167 opposite last page



Only Armour's 2-system Fractionation

can supply you with such a complete line of highest purity fatty acids

Only Armour uses fractional distillation and solvent crystallization to produce a complete line of uniform Neo-Fat fatty acids offering single components in purities as high as 96%. *Yet you pay no premium in price.* Advantages such as these make Armour your *one* best source for all fatty acids. In the list below, you'll find the specific Armour Neo-Fats that will help you produce the finest product at the lowest cost. Write us for samples and information.

PRESSED STEARIC ACIDS
Neo-Fat 18-54 Double Pressed
18-55 Triple Pressed

SPECIALTY COCO ACIDS
Neo-Fat 8 Commercially Pure Caprylic
10 Commercially Pure Capric
12 Commercially Pure Lauric
14 Commercially Pure Myristic
265 Double Distilled Coco
Plus tailored blends of coco fractions

SPECIALTY PALMITICS AND STEARIC ACID
Neo-Fat 16 Commercially Pure Palmitic
16-54 70% Palmitic
18 Commercially Pure Stearic
18-57 65% Stearic
18-58 70% Stearic
18-61 80% Stearic

OLEIC ACIDS
Neo-Fat 92-04 Low Titer White Oleic
94-04 Low Titer Red Oil
94-10 High Titer Red Oil

Solvent recovery grade of activated carbon has long life . . .

capillary structure, pore size give selectivity in adsorption for many gases and vapors

Uses: Product is used for solvent recovery, removing impurities and odors from air and gas, as a catalyst or carrier for catalysts, moving bed adsorbers for separation and purification of light hydrocarbon gases, and in chromatographic separations.

Features: The carbon has a high adsorption capacity for solvents, has a long life, and is very economical. Solvents are removed by a low pressure steaming cycle. When carbon is used for purification, it can be regenerated by passing low pressure steam over the bed.

High selectivity, physical ruggedness, and low attrition losses make the carbon well suited for use in moving bed adsorbers. Its capillary structure and pore size make this carbon highly selective for adsorption of many gases and vapors.

Description: Activated carbon is made from coconut shells, which gives a hard structure to resist attrition. Manufacturer will furnish carbons to meet customer requirements.

(G-32 Activated Carbon is a product of Catalyst Dept., The Girdler Co., Div. of National Cylinder Gas Co., Dept. CP, 224 E. Broadway, Louisville 1, Ky. . . . or for more information about manufacturer's product, reader may simply check CP 5168 on form opposite last page.)

Sees good heat resistance and low volatility in low-temp plasticizer . . .

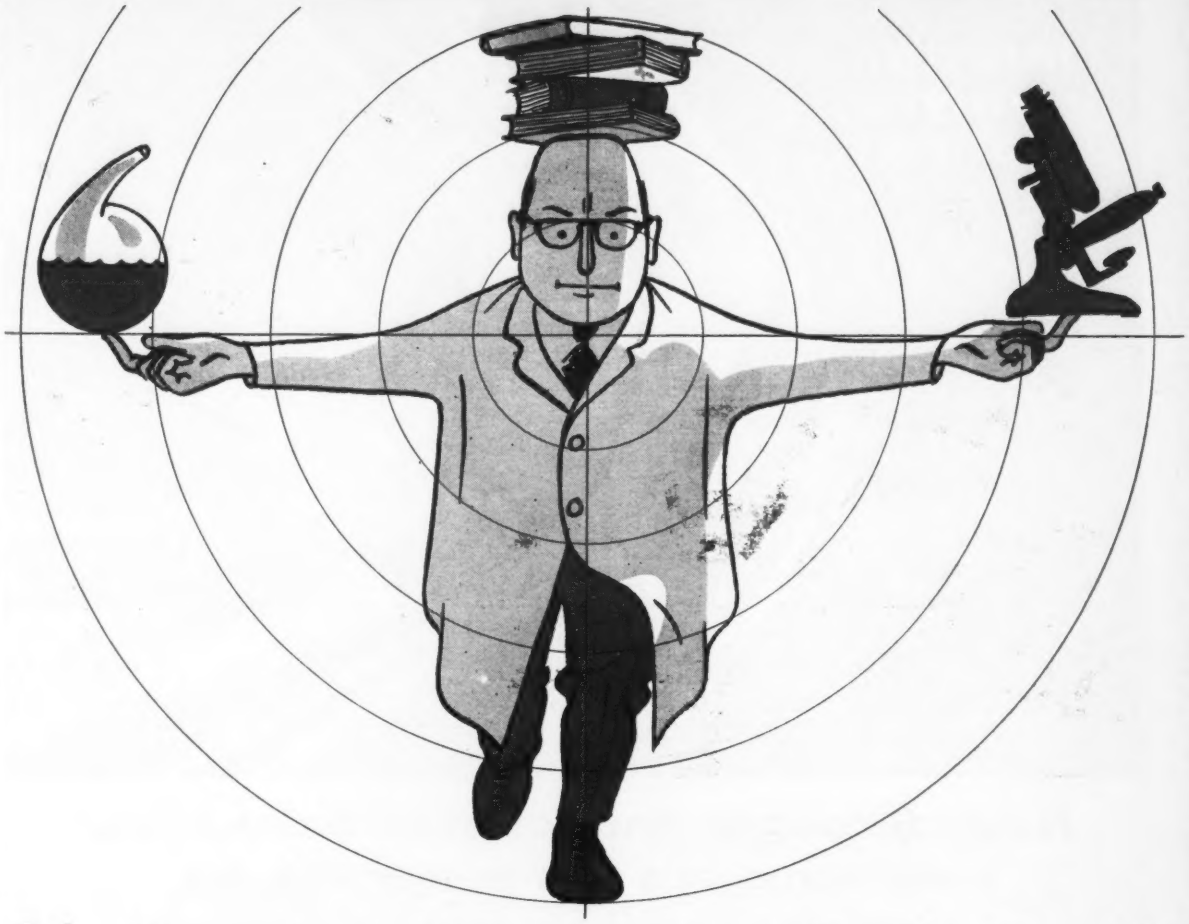
can be used in making transparent vinyls

Uses: As a low-temp plasticizer for vinyls.

Features: Plasticizer also provides relatively low volatility and good resistance to heat degradation. Its color is very low, so it may be used in making transparent vinyl products.

Description: Plasticizer is an ester of adipic acid. Its low-temp performance and plasticizing efficiency are nearly equal to dioctyl adipate, but it gives formulations having less than half the volatility.

(Elastex 20-A Plasticizer is a product of Barrett Div., Allied Chemical & Dye Corp., Dept. CP, 40 Rector St., New York 6, N.Y. . . . or for more information about manufacturer's product, reader may simply check CP 5169 on the convenient Reader Service slip which is located opposite last page.)



We like to keep YOUR products "on the beam"

Over the past fifty years of specializing in the production and application of white oils, petrolatums and petroleum sulfonates, it is only natural that we should find many ways that industries can use our products to make *their* products better.

Take, for example, our development of white oils fortified with Vitamin E to assure outstanding stability against odor and color development. Through the use of this Sonneborn improvement, pharmaceutical and cosmetic manufacturers, to name just two industries, give their products longer shelf life and greater saleability.

While our regular line contains many different types and grades of white oils, petrolatums and sulfonates, we specialize in tailor-making these products to fit precise needs. No matter what your problem may be, if it relates to a white oil, a petrolatum or a sulfonate—chances are we can supply a product that's exactly right for you . . . a product that will help keep *your* product "on the beam."

A Product of Sonneborn RESEARCH

L. SONNEBORN SONS, INC. • NEW YORK 10, N. Y.

White Oil, Petrolatum & Sulfonate Div.
L. SONNEBORN SONS, INC., Dept. CP5
300 Fourth Avenue, New York 10, N. Y.

Gentlemen:

Will you please send me Technical Data on the following:

☐ "General Information on White Mineral Oils" I. R. Bulletin "A"
☐ "General Information on Petrolatums" I. R. Bulletin "B"
☐ "General Information on Petroleum Sulfonates" I. R. Bulletin "G"

What can you do to help me solve this problem?

_____

_____

_____

Name.....

Company.....

Address.....

City.....Zone.....State.....

When inquiring check CP 5170 opposite last page

Now! Stronger and tougher paint films!
—with National's new Resyn® 12K-55

RESYN 12K-55 is new. But the copolymer is unchanged. It's the same inherently flexible Resyn 12K that's gained wide recognition among paint makers. The improvement is in the balanced emulsifier system. Particles are smaller. Flow together more readily. Form stronger, tougher films.

RESYN 12K-55 offers still further advantages:

- Uniform color over surfaces of varying porosity
- Improved compatibility with tube color systems
- Excellent color development
- Easy brushing and leveling properties
- Improved stain removal characteristics
- Simpler formulation
- Freeze-thaw stability
- Low temperature film formation
- Borax compatibility
- Lower viscosity
- Prolonged aging stability
- Low residual monomer content

RESYN 12K-55 can be used as a base for interior—and exterior—vinyl paints and primers. Let one of National's Vinyl Specialists explain Resyn 12K-55 more fully. Just write or call your nearest National office.

RESIN DIVISION

National

STARCH PRODUCTS INC.

National Starch Products Inc., 270 Madison Avenue, New York 16, N. Y. • Plainfield, N. J. • Chicago • Los Angeles • San Francisco • Cleveland • St. Louis • Atlanta • Canada: Toronto • Montreal • Vancouver • Mexico City: Polimeros, S. A., Apartado 28504, Mexico 17, D. F.

When inquiring check CP 5171 opposite last page

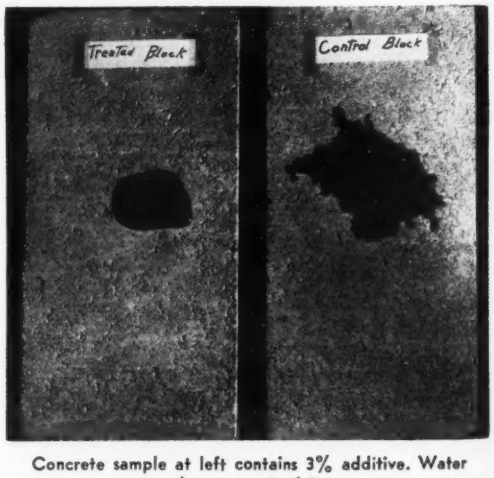
Used in doses 2-6%, emulsion makes concrete permanently water repellent

Low moisture vapor transmission also reduces corrosion of steel products supported by or embedded in concrete

Uses: Emulsion is added to concrete and cements to increase moisture resistance. Steel products, such as pipe or anchor bolts, that are either supported by or embedded in concrete that contains this product are permanently protected from corrosion caused by moisture that would normally migrate through the concrete.

Features: In general, moisture transmission through concrete is cut about in half by addition of 2% (by wt of dry mix) of the emulsion. Four percent addition cuts transmission to about 25% of similar untreated concrete. It also makes the concrete shed water, as shown in photo.

Moisture-proofing agent combines permanently with the concrete and permits inside walls to be painted right on the concrete without danger of blistering and peeling due to moisture coming



Concrete sample at left contains 3% additive. Water has not wetted it

through the wall. In addition to reducing total costs of waterproofing structures, emulsion reduces cracks by acting as a semi-concrete curing agent. It acts as a lubricant in concrete molding operations and makes a cement mix more plastic. This last feature is especially important when harsh aggregates are used.

Shrinkage during cure is minimized because less cement is needed when the emulsion is used.

Description: Losorb is a non-ionic emulsion of low-mw polyindenes and polyolefins. Custard-like,

its solids content is 50% (wt). Emulsion is added to a mix in percentages up to 6% (wt). Water content of the emulsion contributes to overall water content of mix, and should be taken into consideration.

If treated cement blocks are used for construction, the mortar used must also have 3-5% of the emulsion. Cement bonds are not affected.

Test data

Tests were made on a standard concrete block and to a similar block to which 3% Losorb was added. Typical of those used for warehouse construction, the standard block was made by mixing 2200 lb sand, 2600 lb pea gravel, 600 lb air-entrained Portland cement, and water. After a five minute mixing, batch was molded in a Lith-I-Block machine and cured for 24 hr by low-temp steam. For the test block, the same recipe was followed except that 160 lb Losorb was added two minutes after mixing was started. Here are the results:

	Standard cement block	Standard + 3% Losorb
Dry wt (lb)	39.1-38.2	40.1-39.4
Water absorption (wt % after 24 hr in water, ASTM C-140-39)	6.68-6.75	4.21-4.58
Compressive strength (psi, ASTM C-140-39)	1079-994	910-880

If such materials as limestone dust or expanded shale are used in the mix, percent water absorption is dropped even further by addition of the emulsion.

(Cement additive is a product of Pennnsylvania Industrial Chemical Corp., Dept. CP, Clairton, Pa. . . . or for more information check CP 5172 on form opposite last page.)

Styrene's medium flow and setup suit it for injection molding of thin and thick sections . . .

general-purpose formulation comes in both pelleted and granular crystal form

General purpose styrene injection molding material has medium flow and setup. An in-between formulation, it fills a gap between manufacturer's regular-flow (Hi-Flow 77) and soft-flow (Hi-Flow 55) materials. It can be used for moldings with both thin and thick sections, and is supplied in both pelleted and granular crystal form.

(Lustrex Hi-Flow 66 is a product of Plastics Div., Monsanto Chemical Co., Dept. CP, Springfield, Mass. . . . or for more information check CP 5173 on the convenient Reader Service slip which is located opposite last page.)

You'll Reduce Costs 4 Ways When You Order

PITTSBURGH MOLTEN PHTHALIC!

USERS of phthalic anhydride in flake form specify *Pittsburgh* because they like the uniform quality, reliable deliveries and the convenience of *Pittsburgh* "Quick-Open" bags. But if you have facilities for receiving tank truck or tank car shipments of *Pittsburgh* Phthalic Anhydride in *molten* form, you'll enjoy these important cost-saving advantages, too:

1. Lower cost-per-pound.
2. Lower handling costs.
3. Less warehousing and inventory space.
4. Reduced processing time.

And remember: *Pittsburgh* is *doubling* its phthalic output this year . . . greater assurance than ever of *prompt* deliveries in *any* quantity when you buy from *basic Pittsburgh!*

PITTSBURGH COKE & CHEMICAL CO.

WSW 6016

COAL CHEMICALS • PROTECTIVE COATINGS • PLASTICIZERS • ACTIVATED CARBON • COKE • CEMENT • PIG IRON

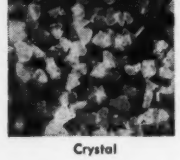
When inquiring check CP 5174 opposite last page

BRIEFS for buyers of

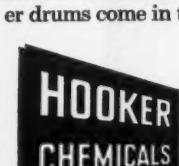
Sodium Sulfide
Sodium Sulfhydrate
Flake Caustic Soda

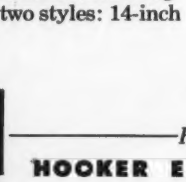
Especially good for repackaging (as in cleansers and other specialties) are these four sizes of Hooker flake caustic soda, all shown actual size.

"Regular," "fine," and "crystal" sizes are nondusting. And with these flakes, you're sure of actually *getting* the size you order. In a tightly-controlled flaking-screening operation, we make the flakes just thick enough to stand up well and stay the same size in transit.


Regular

Fine


Crystal


Powdered

Regular flake is shipped in 100-lb. and 400-lb. steel drums; the other sizes in 450-lb. steel drums. The larger drums come in two styles: 14-inch opening (extra large for easy emptying), or full open head (at slight extra cost).

For data sheet, check the coupon. For test samples, just write and tell us the sizes you'd like.

A tanner could tell you what can happen when sodium sulfide picks up iron.

When this happens in a tannery, the leather is likely to develop blue blotches.

The five steps we take to help *tanners* avoid this situation hold meaning for *you*, if you process with sodium sulfide.

1. We use only our own caustic soda in making sulfide. This gives us close control of its composition.
2. We never re-use a sulfide drum. You receive every shipment in brand new containers.
3. Every drum is lacquer-lined to prevent iron contamination.
4. Six sturdy lugs hold the drum lid tight during handling and storage. They're handy for re-sealing the drum, too.
5. We individually lacquer the lid of every drum, to make an airtight seal that keeps the product at full strength.

The clean, strong flakes dissolve right into process, even without stirring. No waiting; no decanting.

You've probably gathered by now that sodium sulfide, at Hooker, is a specialty of the house. You're right. And that's a good reason why you stand to get maximum satisfaction with ours.

The flake form is shipped in 90-lb. and 350-lb. drums. Solid form comes in 625-lb. drums. Why not order a trial quantity?

Better pH control

What we said about sulfides also goes for Hooker *sodium sulfhydrate*, with this important difference:

Some processors are switching to our sulfhydrate, as a replacement for sodium sulfide. Why?

When sulfhydrate goes into solution, it forms less caustic soda than does sodium sulfide. Only half as much, in fact. So these processors are able to get more sulfidity, with less alkalinity, by using sulfhydrate. Maybe there's an idea here for your processing operations, if high pH is a problem in sulfide solutions.

Hooker sodium sulfhydrate dissolves rapidly, even in cold water. There's virtually no sedimentation even after long standing. You can get it in 90-lb. and 350-lb. drums. For more details, check the coupon.

For Technical Data Sheets

on Hooker chemicals mentioned on this page, check here:

- ☐ Sodium Sulfide
- ☐ Sodium Sulfhydrate
- ☐ Caustic Soda

How up-to-date is your caustic data file? If you're a user of liquid caustic soda, here's some recent material to help you buy better:

- ☐ Caustic Soda Buyer's Guide. Pocket-size booklet lists advantages of 73% and 50% caustic concentrations; comparative costs; includes nomograph for figuring savings with 73%.

Clip and mail today with your name, title, company address.

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HOOKER ELECTROCHEMICAL COMPANY

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When inquiring check CP 5175 opposite last page

By filling and irradiation, polyethylene is made thermoplastic . . .

creep deformation is reduced about 90%, many other properties are improved

Uses: Product is expected to broaden even further the industrial usefulness of polyethylene.

Features: Parts fabricated from this product maintain their form at high temperatures. Their "creep deformation" is reduced about 90%. Excellent corrosion resistance, low-temp flexibility, chemical resistance, and non-melting characteristics are other advantages.

Description: Vulcanized reinforced polyethylene is a highly loaded, carbon black-filled polyethylene formulation which has been cross-linked by high energy irradiation. The black, semi-rigid thermoset plastic is not radioactive, and has specific properties as shown.

	Vulkene 107-E	Low-density polyethylene
Sp gr (room temp)	1.05	0.92
Ultimate tensile (psi @ 73°F)	2400-2600	1800-2000
Yield strength (psi @ 73°F)	1700-1800	1000
Elongation (% @ 73°F)	300-350	400-600
Tear strength (ppi)	700	500
Hardness (Rockwell R)	58	35
No-strength temp (°F) (MW Kellogg standard NTS test procedure)	>680	248
Brittle point (°F) (point where 50% of samples broke)	-30	-105

The plastic has good heat aging properties. Because of the carbon black filler, it is electrically conductive. Compression molded flat sheet samples are available for evaluation.

(Vulkene 107-E is a product of Chemical Development Dept., General Electric Co., Dept. CP, One Plastics Ave., Pittsfield, Mass. . . . or for more information check CP 5176 opposite last page.)

Glass fiber products and applications

Quartz and glass Micro-Fibers for plastic reinforcement and for yarns for the textile industry are covered in eight-page technical catalog. Also included are glass fiber insulation and compressed board.

Form WPD-11 is issued by L.O.F. Glass Fibers Co., Dept. CP, 1810 Madison Ave., Toledo 1, Ohio. When inquiring specify CP 5177 on form opposite last page.

Low viscosity resin rapidly penetrates glass fabrics . . .

gives laminates of high glass content, greater strength

Uses: As a resin for making glass laminates, especially those prepared by vacuum-bag and contact pressure techniques. Resin is also used in castings and in adhesives.

Features: Low viscosity of resin allows it to penetrate rapidly, even in closely woven glass fabrics. Resulting laminates have higher glass content than laminates prepared from previously available resins, and hence have greater strength. Casting materials based on this resin can incorporate more filler, permitting better control of exothermic heat and shrinkage. Adhesive materials, because of their higher filler content, show coefficients of expansion which match closely those of metal adherents.

Description: This low viscosity epoxy resin has viscosity in the 500-900 centipoises range. Contact pressure laminates can be prepared with glass contents as high as 60%. Using vacuum-bag technique, glass content in range of 70% is possible.

(Epon resin 815 is a product of Shell Chemical Corp., Dept. CP, 50 W. 50th St., New York 20, N.Y. Check CP 5178 on form opposite last page.)

Lists C^{14}-tagged organics

Fifteen C^{14}-tagged organics and three S^{35}-tagged organics are listed along with deuterated acetone on single-page price list, available from Tracerlab Inc., Dept. CP, 130 High St., Boston 10, Mass. Check CP 5179 opposite last page.

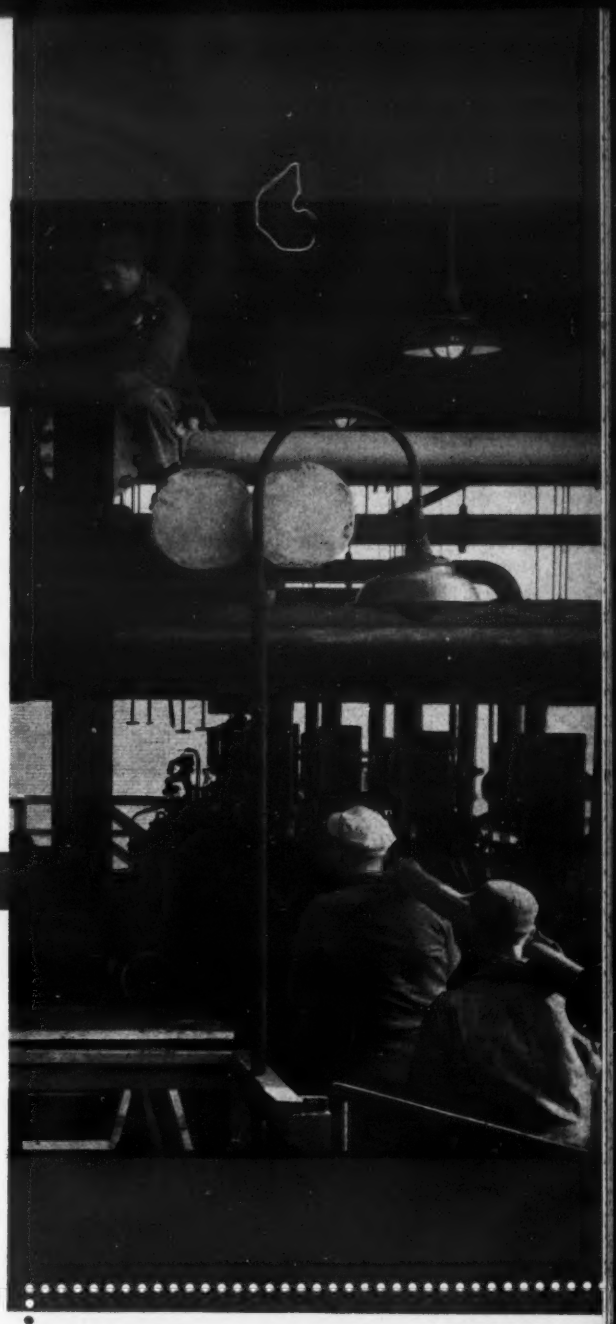
For more information on product at right, specify CP 5180 . . . see information request blank opposite last page.

it won't be long now!

National's Major Plant for large scale production of Aromatic Diisocyanates

NACCONATES*

Nearing Completion at Moundsville, W. Va.



Soon—very soon—polyurethan producers can proceed "full speed ahead"—assured of ample domestic output of NACCONATES (aromatic diisocyanates) for immediate commercial needs.

Our new multi-million dollar NACCONATES plant will multiply available diisocyanate supply many fold. It will help polyurethans to achieve their destiny as "America's next great synthetic".

Pending shakedown of these new facilities, National offers very practical help on polyurethan projects:

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Field Technical Service on your polyurethan production problems.

We invite you to use these helps to the limit. In view of our desire to handle requests in the order of their urgency, we ask that you fill out the coupon completely and attach it to your letterhead.

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☐ *Please send me* NACCONATES *Product Data Package—6 technical bulletins on diisocyanates.*

☐ *Have representative call by appointment.*

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Company: _____

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*Trade Mark

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When inquiring check CP 5181 opposite last page

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When inquiring check CP 5182 opposite last page

CHARGE AND CONSTANTS OF THE THREE

Material	Equiv. Wt.	Alkyd Composition G-6 Equiv.	G-6 Actual charge*	GP-6 Equiv.	GP-6 Actual charge*
Phthalic anhydride	74	0.690	715.0	0.687	712.0
Maleic anhydride	49	0.020	13.7	0.018	12.3
Pentaerythritol	37			0.655	382.0
Excess PE				0.083	
Glycerol	31	0.950	444.0	0.295	131.0
Excess glycerol		0.050			
Abitol	340	0.050	251	0.050	268.0
Excess Abitol		0.050		0.006	
Soybean fatty acids	280	0.290	1145.0	0.295	1165.0

*grams

Final Constants		
Run at % NV in mineral spirits	70	60
Viscosity (G-H)	X-Y	Z_5-Z_{11}
Acid number (based on solids)	6.3	8.3

Here's the results of extensive field testing of interior gloss enamels in industrial atmospheres. It was found that —

hydroabietyl alcohol-modified alkyds retain their gloss

Improved gloss retention with negligible difference in color retention was found with interior gloss enamels based on soya fatty acid alkyds modified with hydroabietyl alcohol, after inside exposure to industrial atmospheres for long periods. Glycerol, pentaerythritol, and glycerol-PE blends were used as the polyols in preparing the alkyds.

For the test, pigmented enamels were sprayed on steel panels and dried. These were exposed for eight years in diffused sunlight to an interior atmosphere that was contaminated with dusts, oil vapors, miscellaneous chemical fumes, and combustion products.

Trade-named Abitol, hydroabietyl alcohol was found to impart these properties to the interior gloss enamels that were tested:

1) Abitol-modified gloss enamels containing 60% total modifier showed better gloss retention and general appearance than did non-Abitol containing systems. This improved gloss retention was particularly evident in glycerol alkyds.
2) Color retention was good, particularly with PE and glycerol-PE systems. Since all panels showed some yellowing, this was a relative valuation.
3) In formulating the enamels, use of Abitol as the modifier allowed the alkyd reaction to proceed to a lower acid number without gelation.
4) Modified alkyds generally exhibited good solubility.

FORMULATIONS

	P-6	
	Equiv.	Actual charge*
	0.686	660.0
	0.017	11.0
	0.948	548.0
	0.052	276.0
	0.297	1090
	50	
	Y	
	12.5	

Recipes

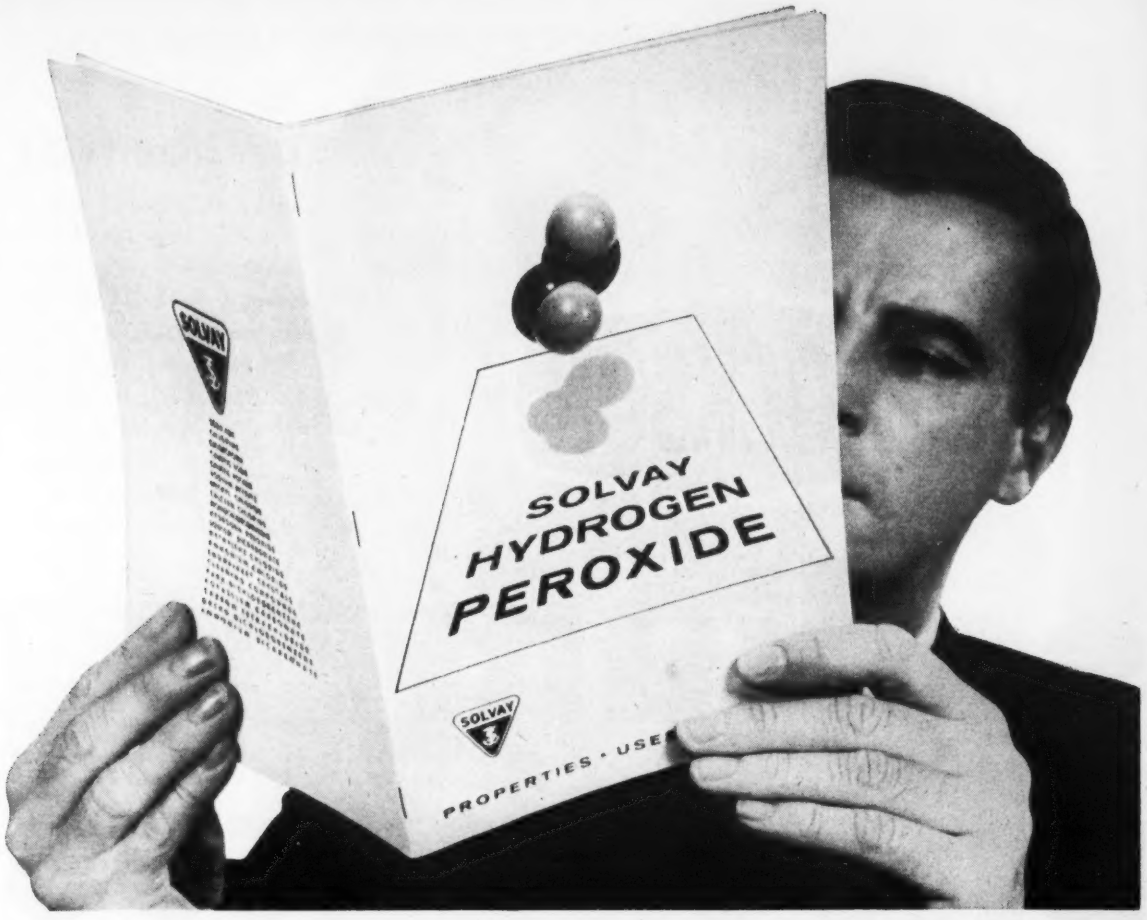
The recipes for three of the modified alkyd enamels that proved best are given below. Modifications are 60%: 50% oil and 10% Abitol. The starting material charges and final constants are given in the table.

Composition G-6: Glycerol alkyd—Heat soybean fatty acids and glycerol to 80-100°C. Add Abitol, phthalic and maleic anhydrides, with heat on. Raise to 160°C, then increase temp at rate of 1°C/min to 235-240°C. Hold until acid number begins to level out, and then increase sparge rate from 150 cc CO_2 /minute to 480 cc/min. Sparge at least one hour for solid acid number below 10. Excess hydroxyl will be 5%.

Composition GP: Glycerol-pentaerythritol alkyd—Heat soybean fatty acids and glycerol to 90-100°C. Add Abitol, phthalic, maleic and PE at 90-120°C. Raise to 160°C, then increase temp at 1°C/min rate to 205-210°C. After acid number levels out, increase sparge from 150 cc to 480 cc/min of CO_2. Sparge for an hour or more to a solid acid number below 10. Excess hydroxyl is 9% total (added as PE and Abitol).

Composition P-6: Pentaerythritol alkyd—Heat fatty acids to 90-100°C. Add PE slowly and raise temp to 210-220°C. Drop temp to 200°C when acid number reaches 15. Add Abitol, phthalic and maleic acids, and react at 230-235°C. Excess hydroxyl is 20%.

(From information supplied by Synthetics Dept., Hercules Powder Co., Inc., Dept. CP, Wilmington 99, Del. . . . or for more information check CP 5183 on form opposite last page.)



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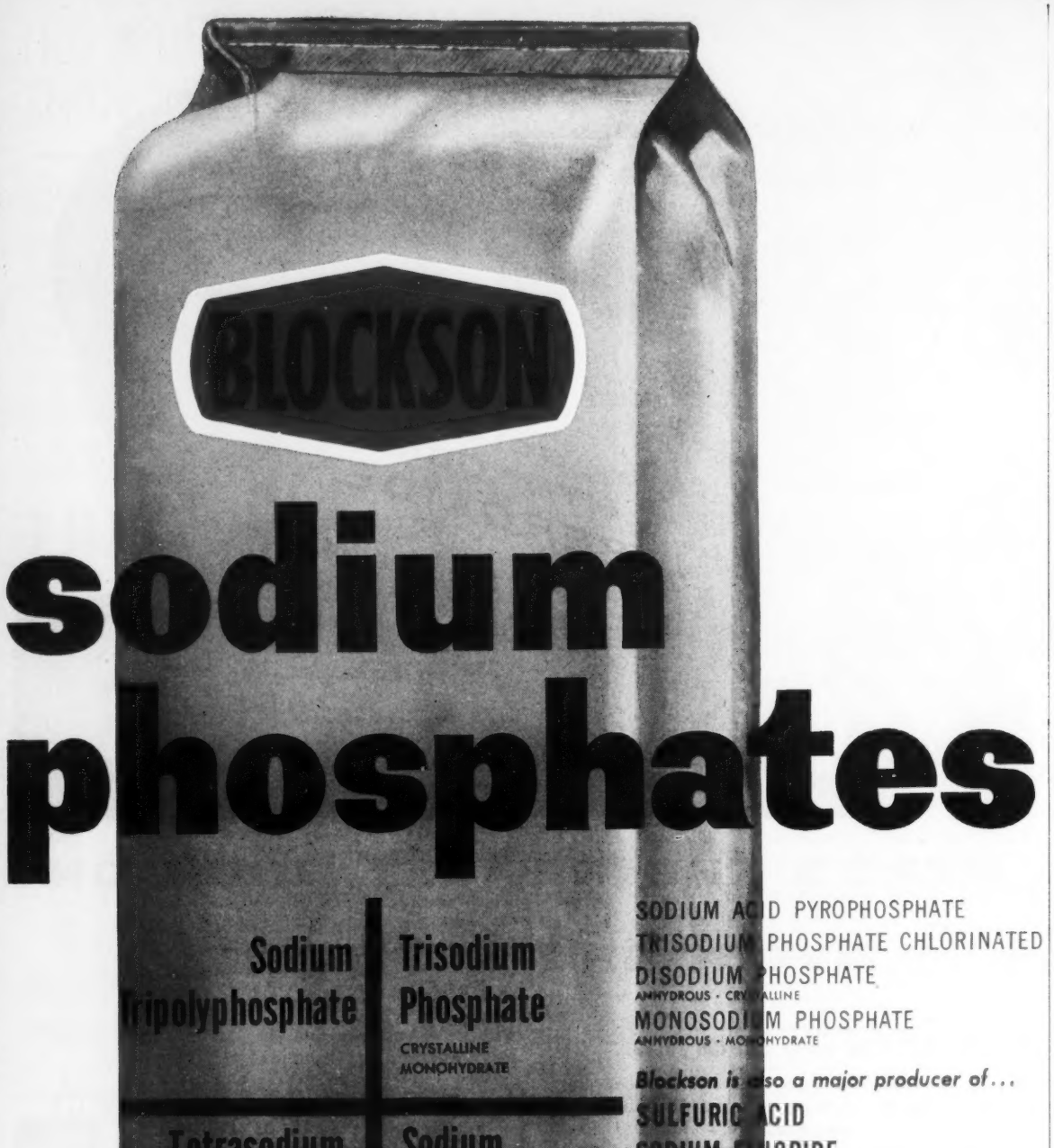
Cleaning Compounds • Methylene Chloride • Monochlorobenzene
Para-dichlorobenzene • Ortho-dichlorobenzene • Hydrogen Peroxide

When inquiring check CP 5184 opposite last page



When inquiring check CP 5185 opposite last page

It's static that makes polyethylene sheets or bags stick together. Here's how to eliminate it . . .

non-toxic destaticizers also impart other desirable properties to the plastic

Uses: To destaticize and to impart desirable physical characteristics to polyethylene.

Features: Fully compatible with polyethylene, liquids permanently destaticize it, allowing bags to open up easily, prevent sheets from clinging together, prevent sparks, and retard dust collection. In addition, they contribute to good mold or extrusion release, better elasticity, increased resiliency, greater clarity, and (in higher amounts) they increase hydrophilic properties which make printing easier and less expensive.

Description: Agents are liquids at room temp and are non-toxic. Used in 0.5-1.5% amounts, they are added to polyethylene powder or pellets and mixed. They do not affect aging of plastic.

(Electrosols D and M are products of Alframine Corp., Dept. CP, 4731 E. 52nd Dr., Los Angeles 22, Calif. Check CP 5186 opposite last page.)

Ten dollars to Stewart Fisher for this cartoon. Stewart hails from South Bend, Ind., works there for U.S. Rubber.

Emulsify pesticides in hard or soft water . . .

two agents may be used separately or blended to give the best results

Uses: For quickly emulsifying most of the common pesticide-solvent systems.

Features: Emulsifiers are effective in both hard or soft water and will withstand adverse storage conditions. Each one is a complete and effective emulsifier in itself for certain formulations. For best results, these should be used individually or blended with each other as specific conditions require. This blendability is the basis for the unusual effectiveness and versatility of these emulsifiers.

In finished sprays, concentrates made with these emulsifiers disperse through the water at once, and remain emulsified for long periods with little or no need for agitation in the spray tank.

Description: Triton X-151 and X-171 are clear, liquid, anhydrous blends of alkyl aryl polyether alcohols with organic sulfonates. They are easy to handle even at temperatures as low as 40°F. Typical properties are:

	Triton X-151	Triton X-171
Color	yellow	amber
Sp gr (25°/25°C)	1.04-1.06	1.04-1.06
Viscosity (Saybolt seconds @ 100°F, about)	200	625
Pour point (ASTM, °F)	10	−10

(Emulsifiers are products of Agricultural and Sanitary Chemicals Dept., Rohm & Haas Co., Dept. CP, Washington Square, Philadelphia 5, Pa. Check CP 5187 on form opposite last page.)

AMP with five percent water with freezing point <32°F makes handling easier

AMP (2-amino-2-methyl-1-propanol) with fatty acid is an emulsifying agent which has found much use in self-polishing waxes. It is also a stabilizer in urea and melamine enamels, an ingredient in textile specialties, and an intermediate. However, it freezes about 90°F. A product containing 2% water has been offered, which reduces the freezing point to 70°F. More recently, AMP has become available containing 5% water. Freezing point is now less than 32°F, which has contributed to ease in handling.

(AMP with 5% water is a product of Commercial Solvents Corp., Dept. CP, 260 Madison Ave., New York 16, N.Y. . . . or for more information check CP 5188 on form opposite last page.)

LOW RECOVERY COST of LOW BOILING SOLVENTS

Low boiling solvents used commercially are very readily recovered with activated charcoal solvent recovery equipment. Direct operating cost of a Barnebey-Cheney Automatic Solvent Recovery System is about 2c per gallon for most water immicible low boiling solvents. This is a small fraction of the original solvent cost, and offers a savings potential that can quickly amortize your investment in recovery equipment.

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When inquiring check CP 5189 opposite last page

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PH VALVE..... 5.0 to 5.2
MOISTURE 0.5%

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resins
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Pennsylvania Industrial Chemical Corp.
Clairton, Pennsylvania

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(CP)

When inquiring check CP 5191 opposite last page

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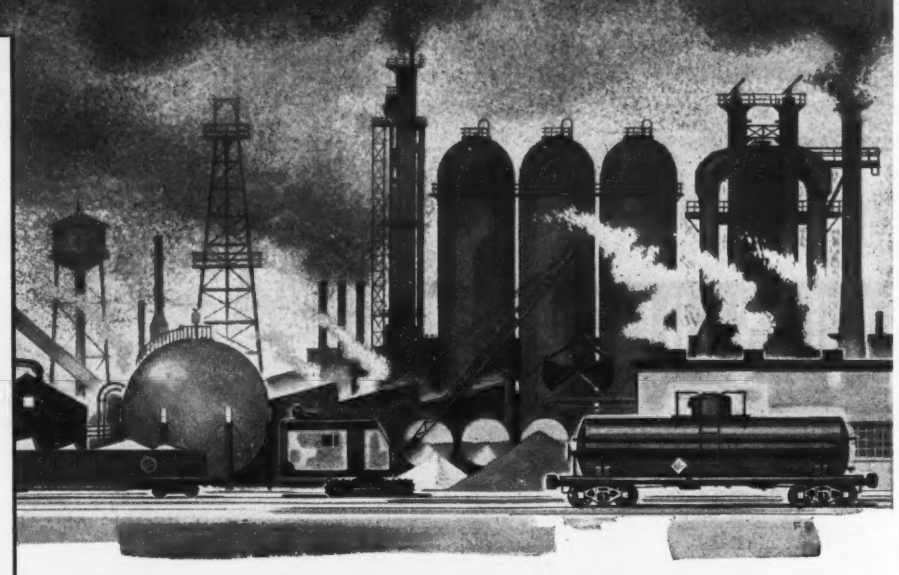

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When inquiring check CP 5192 opposite last page

Economical, easily handled liquid makes phosphate supplement for animal feeds . . .

contains a minimum of 23.7% phosphorus

Uses: As a replacement for phosphate supplements which are presently used in dry form by the feed industry.

Features: Being a liquid, handling costs are reduced, and no segregation of material occurs. Addition of material is easy and there is no problem of dustiness. Manufacturer has greater flexibility for making higher energy feeds since solution is more concentrated than dry phosphates. Because of its higher percent phosphorus, liquid is more economical to use than dry forms.

Description: Feed solution contains a minimum of 23.7% phosphorus. It is produced from phosphoric acid. Readily available standard equipment generally can be adapted to provide proper amounts for either continuous or batch process feed mills. Additive won't affect vitamins, antibiotics, and other components of animal feeds.

(Phosphate feed solution is a product of Inorganic Chemicals Div., Monsanto Chemical Co., Dept. CP, 1700 S. Second St., St. Louis 4, Mo. . . . or for more information check CP 5193 opp. last page.)

Up to 40 pounds of clear epoxy resin have been easily made with mild, amine hardener . . .

these are the largest clear castings produced in a single pour

Uses: As a hardener for epoxy resins, especially clear formulations.

Features: Masses up to 40 pounds of clear resin have been prepared with no difficulty. These are the largest single clear castings which have been produced in a single pour. Hardener has no offensive odor, no tendency to crystallize, and is relatively non-toxic.

Description: Promoter D-40 is a mild, amine hardener that is high boiling and has a low order of reactivity. Used in a weight ratio of 15 parts per 100 of clear base epoxy resin (such as Epocast 6010) it cures at 140-200°F. Pot life is about 24 hr at room temp. Cure cycle extends for 15 hr at the lower temperatures. Gelation takes place after 5-8 hr so that the polymer network that forms is relatively strain-free. This slow cure permits bubbles to rise before gelation.

(Epoxy hardener is a product of Furane Plastics Inc., Dept. CP, 4516 Brazil St., Los Angeles 39, Calif. . . . or for more information check CP 5194 on form opposite last page.)

Fuel-oil-resistant low-shrinkage rubber . . .

compound has received UL approval for fuel oil service

Uses: Fabrication of O-rings or other sealing members.

Features: Compound has good resistance to oils. Immersion for 28 days at 250°F causes little increase in hardness. There is good retention of elongation and tensile properties. Air drying for 24 hours at 158°F causes only very slight shrinkage. It is UL approved for fuel oil service.

Description: Material is a nitrile rubber with the following original physical properties:

Hardness (Shore A)	68 ± 5°
Tensile Strength (psi)	2100 min
Elongation (%)	345 min
Sp gr	1.235 ± 0.02

(Compound 37-751 rubber is a product of Rubber Products Div., The Parker Appliance Co., Dept. CP, 17325 Euclid Ave., Cleveland 12, Ohio . . . or for more information check CP 5195 on the Reader Service slip which is located opposite last page.)

Adds anhydrous ether, ethylene glycol as reagents

Anhydrous ethyl ether meets ACS and USP reagent specs. Max sp gr (25°/25°C) is 0.7097. Reagent contains 0.00020-0.00040% stabilizer (tentative).

Ethylene glycol reagent has sp gr (25°/25°C) of 1.111-1.115 and distills between 195-198°C (ASTM D-1078-49T).

(Reagents are products of Chemical Div., Merck & Co., Dept. CP, Rahway, N.J. . . . or for more information check CP 5196 on form opposite last page.)

For more information on product at right, specify CP 5197 . . . see information request blank opposite last page.

A caliper survey was made to detect corrosion of oil-well tubing. Erratic "blips" on the survey chart indicate corrosion in well using ordinary inhibitor. Parts of two corroded tubes are shown at right.

Evenly spaced "blips" in this chart show no corrosion, merely indicate tubing joints in well using inhibitor containing Sunaptic acid. The tubes look like new. Both surveys taken after one year.

Sunaptic Acid's king-size molecules give twice the efficiency of fatty, rosin, synthetic, or ordinary naphthenic acids

USED IN CORROSION INHIBITORS, A SUNAPTIC ACID CUTS COSTS . . . GIVES GREATER PROTECTION TO OIL WELLS

In the above oil-well tests, the substitution of high-molecular-weight Sunaptic® acid for fatty, rosin, synthetic or ordinary naphthenic acids doubled the efficiency of the corrosion inhibitor.

The reason: the king-size molecules of Sun Oil Company's Sunaptic acid. Characteristic features of a typical molecular structure are: one carboxyl group per molecule, three saturated rings, and ring substituents of methyl, ethyl, or other aliphatic groups.

Sunaptic acids have other unusual properties: no olefinic unsaturation, high resistance to oxidative rancidity, low freezing or pour points, and a higher hydrocarbon solubility than fatty, rosin, and ordinary naphthenic acids.

Typical applications of Sunaptic acid derivatives include anti-oxidants, oil-soluble detergents, lubricant additives, plasticizers. A switch to a Sunaptic acid can possibly improve any product you're now making with fatty, rosin, synthetic, or ordinary naphthenic acids.

For full information on Sunaptic acids and their uses, see your Sun representative, or write SUN OIL COMPANY, Phila. 3, Pa., Dept. CP-5.

FREE TECHNICAL BULLETINS ON OTHER SUNOCO PETROCHEMICALS

Benzene, Toluene, Mixed Xylenes • Propylene Tetramer • Propylene Trimer • PDO-40 (polymerized drying oil) • Sulfonate WS (water-soluble sulfonate) • Sulfur • Anhydrous Ammonia

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INDUSTRIAL PRODUCTS DEPARTMENT

SUN OIL COMPANY PHILA. 3, PA.

IN CANADA: SUN OIL COMPANY LIMITED, TORONTO AND MONTREAL

SUNOCO

technical data from

ATLAS

CHEMICALS DIVISION
ATLAS POWDER COMPANY, WILMINGTON 99, DELAWARE
Atlas Powder Company, Canada, Ltd., Brantford, Ontario, Canada

...FOR THE CHEMICAL INDUSTRY:

Atlas Organic Chemicals

Organic chemicals having an extensive range of uses in chemical processing are outlined in this catalog. Sorbitol, mannitol and related polyols, and their uses, are described. Data is included on Atlas surface active agents, with a listing of typical Atlas surfactants and a selection guide.

Catalog also has information on ATLAC® polyester resins for use in reinforced plastics, and DARCO® activated carbons for purifying, deodorizing and decolorizing applications. Check "Atlas Organic Chemicals Catalog" on coupon below.

...FOR CHEMICAL SPECIALTY MANUFACTURERS:

Atlas Antistatic Agents

This informative booklet should prove helpful to manufacturers interested in the widespread need for antistatic compounds. The booklet surveys the market for antistatic specialties, and describes their use in textile processing, drycleaning, laundering, and many other applications.

Of further interest to chemical specialty manufacturers is an Atlas bulletin, "Static Testing Procedure," giving testing data and a diagram showing how testing apparatus is assembled for measuring static on textiles. Check coupon for either or both pieces of literature.

...FOR PLASTICS MOLDERS:

ATLAC® 382 Polyester Resins

ATLAC 382 is a *different* kind of polyester, and its unique advantages are worth investigating. Four detailed Atlas technical bulletins are available: ATLAC 382 general data, ATLAC 382 in wet lay-up, ATLAC 382 in pre-impregnated materials, ATLAC 382 in pre-mix molding compounds and powders.

Also available is a reprint of magazine article, "Cost Reduced $15 per Unit," telling how food machine manufacturer gained important savings by switching from aluminum to ATLAC. Check coupon below.

ATLAS POWDER COMPANY
Dept. ASP
Wilmington 99, Delaware

Please send me the Atlas literature checked below.

☐ *Organic Chemicals Catalog*
☐ *Antistatic Testing Procedure*
☐ *Antistatic Specialty Products Booklet*
☐ *Reprint of magazine article on ATLAC*
☐ *ATLAC 382 technical bulletins*

*Name*_____ *Title*_____

*Company*_____

*Address*_____

*City*_____ *Zone*_____ *State*_____

When inquiring check CP 5198 opposite last page

Use low-pressure laminating way to apply decorative, protective surface to structural boards . . .

these modified triazine varnishes overcome disadvantages of previous surfacing methods

Uses: For applying a decorative, protective plastic surface to low-cost structural boards.

Features: Surface properties of boards finished with resins by low-pressure laminating techniques approach those of standard decorative melamine laminates.

Description: Here's how to do it: Standard decorative print stock and overlay paper are treated with manufacturer's modified triazine resin varnishes. Conventional equipment is used. Treated papers are completely dry and non-blocking and may easily be laminated to hardboards or low-density particle boards. Cure is about 10 min @ 300°F and 250 psi.

(Experimental resins PDL-1-2247 and PDL-1-2352 are products of American Cyanamid Co., Dept. CP, 30 Rockefeller Plaza, New York 20, N.Y. Check CP 5199 opposite last page.)

Gives polyethylene specifications, tells how to mold by injection

"Specifications — Tenite Polyethylene" gives information on eight basic polyethylene plastics that range in tensile strength from 1100 psi to 2150 psi @ 73°F, and also 20 modified polyethylenes. There are six pages of tables and five of descriptive text in this 16-page booklet.

"Injection Molding of Tenite Polyethylene" contains general, basic information on molding this plastic, and a guide for correcting molding difficulties. Melt casting, dipping, machining, welding, heat sealing, and printing are also included.

Both brochures are issued by Eastman Chemical Products, Inc., a sub. of Eastman Kodak Co., Dept. CP, Kingsport, Tenn. When inquiring check CP 5200 for the "Specifications" bulletin and CP 5201 for the "Injection Molding" bulletin on form opposite last page.

Want a quick "locator" for specific chemical materials discussed in this issue . . . ?

The alphabetical Product Directory (starting on page 234 will give you a handy page reference to all articles and advertisements.

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Caprylate	Eldo 18* Coconate	Caprate
Laurate		Myristate
Caproate		Palmitate

*T. M. Reg.

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In Cleveland F. W. Kamin Co.

When inquiring check CP 5202 opposite last page

Resilient, tough coating given by epoxy compound . . .

resin developed for transformers meets MIL-T-27A specs

Uses: Potting and encapsulating large metal masses.

Features: Epoxy compound forms a resilient, heat-resistant, tough casting for transformers, power bushings, and related equipment. It meets requirements of MIL-T-27A specifications.

Description: The filled epoxy base is supplied as soft solid which melts to an easily handled, low-viscosity liquid. Pot life at 130°C is approximately 1 hr. It cures in 24 hr at 110°C or 1½ hr at 170°C with manufacturer's Hardener D.

(Hysol 6600 epoxy resin is a product of Electrical Insulation Materials Div., Houghton Laboratories, Inc. Dept. CP, 322 Houghton Ave., Olean, N.Y. . . . or for more information check CP 5203 on form which is located opposite last page.)

Synthetic fluids and lubricants

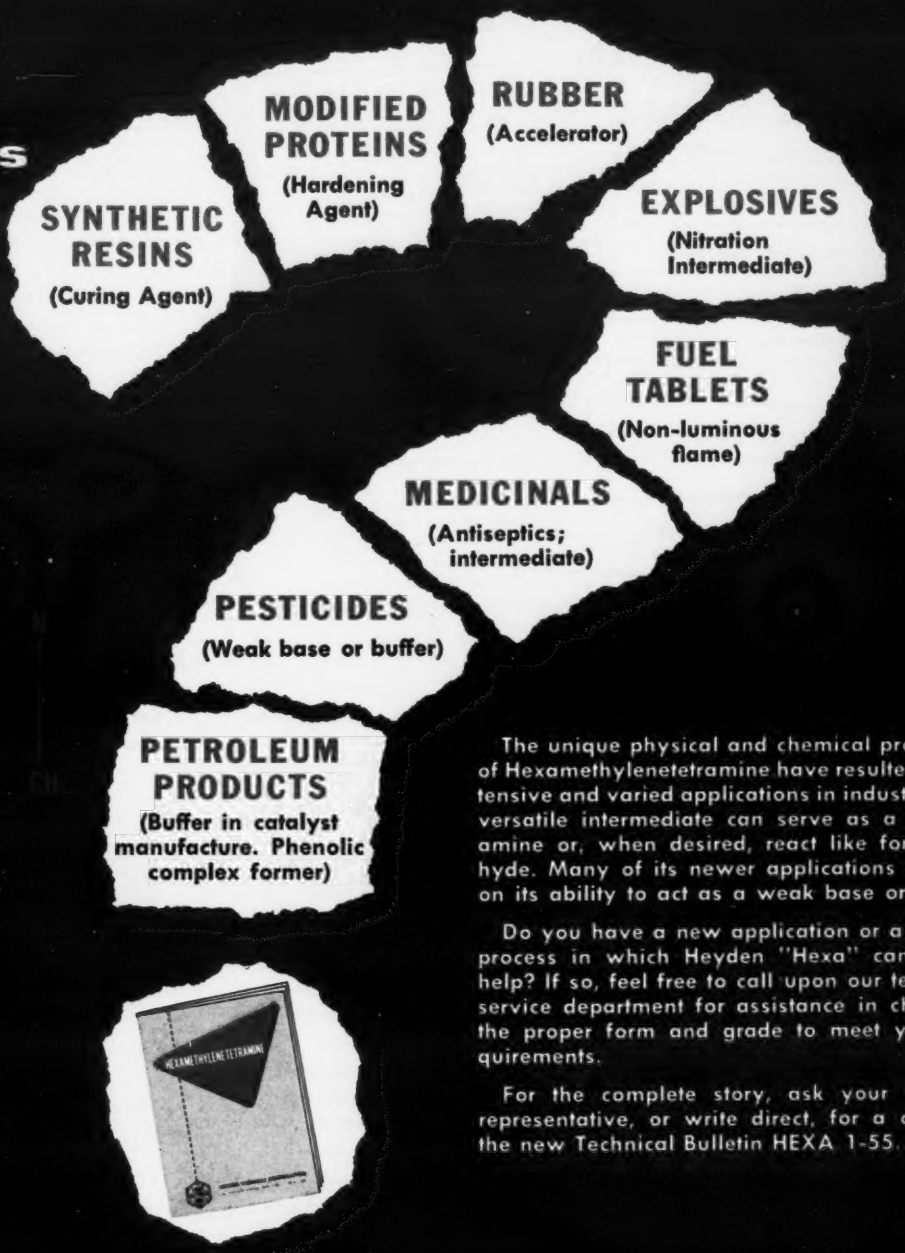
Detailed descriptions of Ucon polyalkylene-glycol derivatives for lubricants, hydraulic fluids, heat-transfer fluids, anti-foam agents, solvents, and formulation components are given in 52-page technical bulletin. Graphs, tables, and illustrations are used along with text to tell the story. A one-page bibliography is included.

Form 6500D is issued by Carbide & Carbon Chemicals Co., a Div. of Union Carbide & Carbon Corp., Dept. CP, 30 E. 42nd St., New York 17, N.Y. When inquiring specify CP 5204 on form opp. last page.

For more information on product at right, specify CP 5205 . . . see information request blank opposite last page.

Does HEYDEN HEXAMETHYLENETETRAMINE

Fit into YOUR process picture



The unique physical and chemical properties of Hexamethylenetetramine have resulted in extensive and varied applications in industry. This versatile intermediate can serve as a tertiary amine or, when desired, react like formaldehyde. Many of its newer applications depend on its ability to act as a weak base or buffer.

Do you have a new application or a current process in which Heyden "Hexa" can be of help? If so, feel free to call upon our technical service department for assistance in choosing the proper form and grade to meet your requirements.

For the complete story, ask your Heyden representative, or write direct, for a copy of the new Technical Bulletin HEXA 1-55.

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U.S. Patent No. 2,460,733
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U.S. Patent No. 2,630,441
ADDITION PRODUCTS

U.S. Patent No. 2,624,708
INHIBITED POLYOXYALKYLENE GLYCOL FLUIDS

U.S. Patent No. 2,606,199
NONIONIC SURFACE ACTIVE AGENT

U.S. Patent No. 2,435,619
LUBRICANT COMPOSITIONS

U.S. Patent No. 2,469,108
WAX-POLYAMIDE-PINENE RESIN COATING COMPOSITION

U.S. Patent No. 2,653,948
VINYL CHLORIDE POLYMERS PLASTICIZED WITH ADDITION PRODUCTS OF ESTERS

U.S. Patent No. 2,347,562
HIGH MOLECULAR WEIGHT POLYHYDRIC ALCOHOL

U.S. Patent No. 2,435,478
POLYAMIDES FROM POLYOCTADECA-POLYENYLAMINE

U.S. Patent No. 2,536,568
ALLYL ESTERS OF FATTY ACIDS

U.S. Patent No. 2,555,104
ALUMINUM SOAP COMPOSITIONS AND GREASES CONTAINING THEM

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WINTERIZED VEGETABLE OIL

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Please send complete information on Empol 1022 Polymerized Fatty Acid.

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Company.....
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City.....State.....

When inquiring check CP 5206 opposite last page

Gelling agent for water systems is easily dispersed . . .

silicate clay very effective in alkaline media

Uses: As a thixotropic assistant, suspending agent, and emulsion stabilizer in aqueous systems.

Features: Easily dispersed, as little as 1% has been found effective, while 10% gives a highly gelled structure. It is very effective in alkaline media.

Description: The smooth flowing, fine, off-white powder is a highly absorptive silicate clay treated to have hydrophilic characteristics. It is insoluble in water and organic liquids.

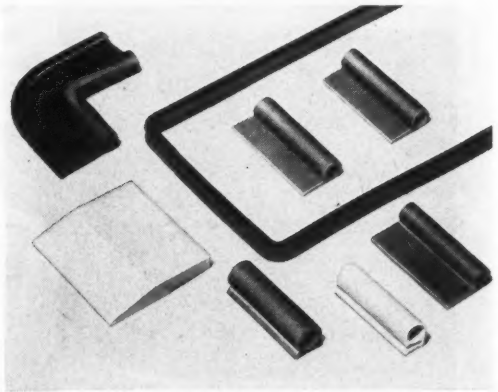
(Abco-Gel is a product of Abco Chemical Co., Dept. CP, 2316 Atlantic Ave., Brooklyn 33, N.Y. . . . or for more information check CP 5207 on form opposite last page.)

Superior strength, abrasion resistance in silicone rubber that's reinforced with ester-coated silica . . .

there is no problem of rapid cure or overcure at high temperatures

Uses: For molding and extrusion of parts, for example, external seals on aircraft.

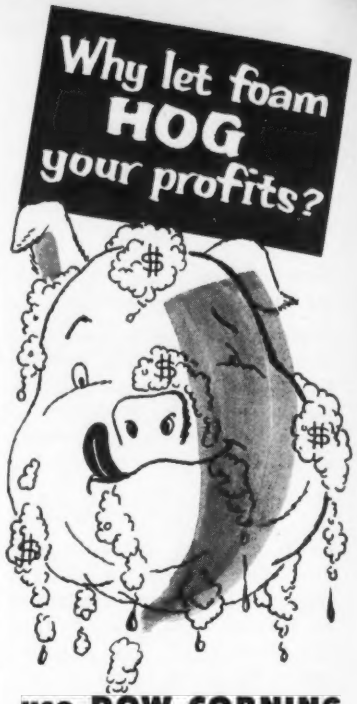
Features: Compounds overcome two of the disadvantages of conventional silicone rubber:



Molded products made from reinforced silicone

namely low tear strength and poor abrasion resistance. They retain the basically desirable characteristics of silicone rubber: immunity to ozone deterioration, high- and low-temp flexibility, and non-stick surface.

Description: These compounds owe their greater strength and abrasion resistance to a filler of ester-coated fine silica developed by Du Pont and called



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* T.M. REG. U.S. PAT. OFF.

When inquiring check CP 5208 opposite last page

Valron (see CHEMICAL PROCESSING, July 1955, pp 36-37). The problem of agent's rapid cure and its tendency to overcure at high temperature has been eliminated by including an inhibitor in the compounds.

There are two products, Cohrlastic HT 655, a 50 Duro methyl-base material, is designed for high-temp work and will remain flexible at −65°F. Cohrlastic HT 666 is a 60 Duro methyl phenyl-base material. It has original properties equal to or better than those of HT 655 in tear resistance; it is slightly lower in tensile and elongation; but it has outstanding low-temp flexibility at −100°F. A comparison of HT 655 with a typical commercial silicone rubber is given in the table.

	Cohrlastic HT 655	Commercial silicone compound
Tear strength (ppi)		
@ Room temp	197	101
@ 400°F	100	23
Tensile strength (psi)		
@ Room temp	1650	695
@ 400°F	665	270
Elongation (%)		
@ Room temp	900	390
@ 400°F	390	230

(Cohrlastic silicone rubbers are products of Connecticut Hard Rubber Co., Dept. CP, New Haven 9, Conn. . . . or for more information check CP 5209 on form opposite last page.)

"QUICK! RUN UP TO THE LAB AND TELL THEM THE ALCOHOL LOCKER IS LEAKING AGAIN!"

For prompt delivery . . . specify

$H_2N-\overset{\overset{O}{\|}}{C}-NH_2$

DU PONT Crystal Urea

(CARBAMIDE)

Dependably pure and uniform chemical with these rigid specifications:

- pH (10% solution at 20°C.) . . . . . 7.0 to 9.8
- Water . . . . . 0.50% Max.
- Ash . . . . . 35 p.p.m. Max.
- Iron . . . . . 2 p.p.m. Max.
- Free Ammonia . . . . . 20 p.p.m. Max.
- Color, A.P.H.A. (10g. in 100 ml. methanol) . . . . . 10 Max.
- Turbidity, A.P.H.A. (50g. in 100 ml. water) . . . . . 20 p.p.m. Max.

How industry uses this versatile chemical:

The purity and uniformity of Du Pont Crystal Urea make it ideal for use in a large number of products and processes. Listed below are some of the many fields in which it is being used today.

ADHESIVES: Manufacture of urea-formaldehyde resin adhesives, including plywood and paper adhesives, binder for composition board made of wood waste, cold-set glues, laminating resins, and core binders . . . solubilizer in casein, animal and starch glues.

FINISHES: In enamels and other finishes in the form of modified urea-formaldehyde resins . . . in fire-resistant paints.

PAPER: In urea-formaldehyde resins for imparting wet strength to paper and paper coatings . . . softener for glassine paper and similar products . . . ingredient in fire-resistant compositions . . . solubilizer for starch in coatings.

PLASTICS: Manufacture of urea-formaldehyde resin molding compositions.

TEXTILES: In urea-formaldehyde resins to improve crush and crease resistance . . . in acid and direct dyes for screen and roller printing of textiles . . . with starch and other materials for sizing and finishing many types of textiles . . . in flameproofing compositions.

Du Pont Crystal Urea also finds many uses in such fields as cosmetics, detergents and pharmaceuticals.

Du Pont Crystal Urea is packaged in 100-lb. multi-ply paper bags. Prompt shipment can be made from strategically located stock points.

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Please send me full information on Du Pont Crystal Urea—including specifications, chemical and physical properties, suggested uses, bibliography, etc. I am particularly interested in using Crystal Urea for the following applications: _____

_____

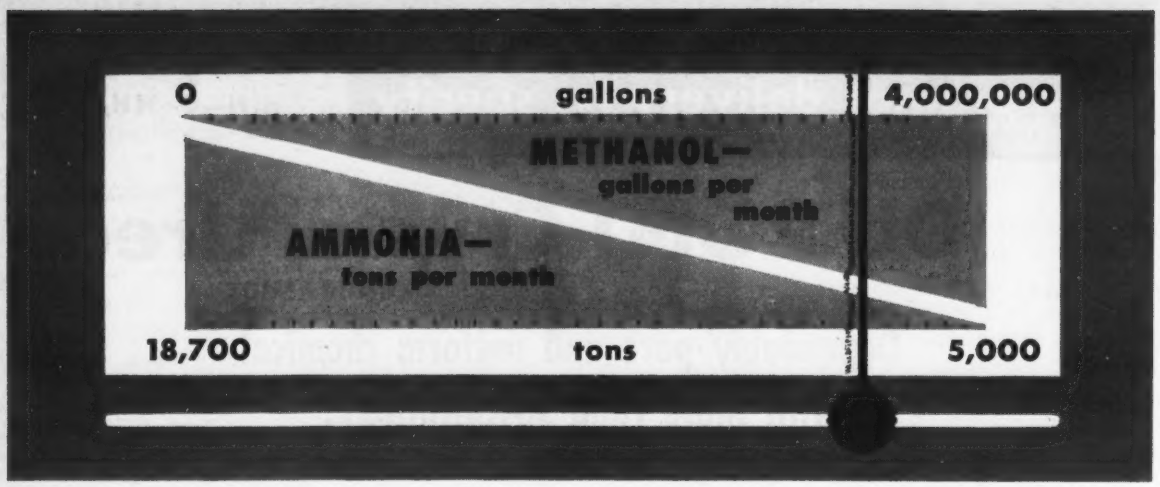
Name _____ *Position* _____

Firm _____

Address _____

City _____ *State* _____

When inquiring check CP 5210 opposite last page



Olin Mathieson adjusts *supply* to *demand*

During the recent methanol shortage Olin Mathieson was able to increase production from one car per day to ten cars in 24 hours . . . able to ship a loaded barge in 48 hours. That's because the Morgantown Plant is engineered for maximum flexibility of output . . . to supply either ammonia or methanol against demand.

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If your production depends upon a dependable supply of methanol, it will be to your advantage to talk over your requirements with an Olin Mathieson representative soon. Call the nearest office or write today.

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ORGANIC CHEMICALS: Ethylene Oxide • Ethylene Glycols • Polyethylene Glycols • Glycol Ether Solvents • Ethylene Dichloride • Dichloroethylether • Formaldehyde Methanol • Sodium Methylate • Hexamine • Ethylene Diamine • Polyamines • Ethanolamines • Trichlorobenzene • Polychlorobenzene • Trichlorophenol

When inquiring check CP 5211 opposite last page

Cites advantages of fatty acids in making lubricating grease

Advantages of fatty acids over tallow and vegetable fats in making lubricating grease are discussed in eight-page bulletin. Included are raw material variations, economic considerations, use of pre-formed soaps, grease production with fatty acids, and a comparison of fatty acid soap *vs.* non-soap gels. There are seven references.

"Using Fatty Acids in Lubricating Greases" is issued by Fatty Acid Div., Association of American Soap & Glycerine Producers, Inc., Dept. CP, 295 Madison Ave., New York 17, N.Y. When inquiring specify CP 5212 on form opposite last page.

Serves as convenient source of iodine for germicides . . .

non-toxic powder is easy-to-handle, water-soluble, and very efficient

Uses: For making liquid or powdered types of iodine germicides and detergent-sanitizer products known as iodophors. Products are broad-spectrum germicides for food, dairy, institutional, and industrial applications.

Features: A non-toxic powder, product overcomes disadvantages of elemental iodine as a germicide. Powder is water-soluble and can be used even with hard waters. It is non-corrosive, non-staining, and stable to heat and light in normal storage. Although the product contains iodine, the halogen's partial pressure — and therefore its odor — are low.

Solutions are self-indicating. As long as an amber color is evident, solutions are active germicidally.

Description: Called Idonyx, product is an iodide-iodate mixture that contains nonylphenyl polyethylene-glycol ether and hydrated complex phosphates. The fine, yellow powder has a 1.05-1.15 sp gr. A minimum of 15.5% iodine is yielded when powder reacts with acid, according to this equation:

$$5I^- + IO_3^- + 6H^+ \rightarrow 3I_2 + 3H_2O$$

In addition to this loosely complexed iodine, there is also some iodine that is chemically combined and is not available or titratable.

Making Iodophors

Since an iodophor is a combination of iodine and a solubilizing agent (such as a nonionic and surface active agent), it has both sanitizing and detergent properties. With Idonyx, both powdered and liquid types can be made. Suggested formulations are given.

A powdered iodophor liberates iodine when dissolved in water. To make it, mix the ingredients shown in Table I, avoiding extreme temperature, humidities, and any contact with water. Store in moisture-proof containers in a cool, dry place.

Table I
Powdered Iodophor

	wt %
Idonyx	12.5
Neutronyx PX*	50.0
Sulfamic acid	30.0
Na acid pyrophosphate	7.5

Table II
Liquid Iodophor

Idonyx	12.5
Neutronyx 640*	20.5
HCl (37%)	10.0
H_3PO_4 (85%)	12.0
Water	45.0

*Nonylphenol polyethyleneglycol ethers. Neutronyx 640 is 100%-active; PX is 20%-active powder built with complex phosphate salts.

A liquid formulation is given in Table II. Using glass-lined or stainless steel equipment, dissolve Idonyx in 110-120°F water. Add Neutronyx 640 and mix. Keeping temperature below 100°F, add HCl slowly. Then add phosphoric acid and cool to room temp. Pack in glass or plastic bottles.

Both formulations give a product having 1.75% available iodine. For use as a sanitizer, dilute to 12.5 ppm available iodine. Optimum results are obtained at 75-100°F. Both powder and liquid types are equal in effectiveness and tests show they give a 99.9999% kill in 30 seconds in recommended dilutions.

(Idonyx and Neutronyx PX and 640 are products of Industrial Div., Onyx Oil & Chemical Co., Dept. CP, 190 Warren St., Jersey City 2, N.J. . . . or for more information check CP 5213 on form opposite last page.)

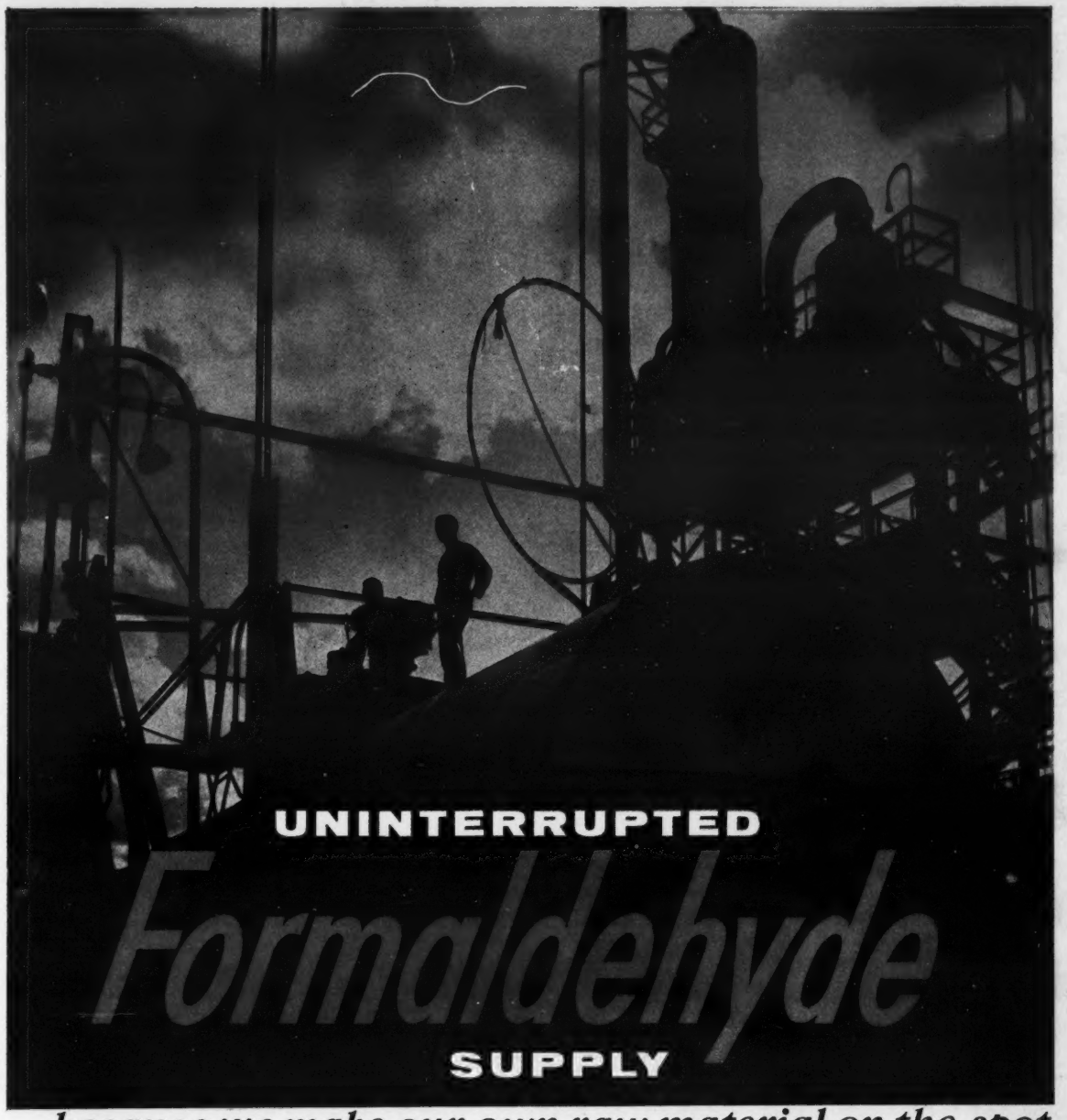
Vinyl ester trio for surface coatings, adhesives, oil additives, and plastics . . .

vinyl propionate, butyrate, and 2-ethylhexoate are now in commercial production

Three esters, vinyl propionate, vinyl butyrate, and vinyl 2-ethylhexoate are now in commercial production at maker's Niagara Falls, N.Y., plant.

Polymers based on these esters are being used in surface coatings, adhesives, oil additives, and vinyl sheeting. When copolymerized, the esters are used as plastics.

(Vinyl esters are products of Carbide & Carbon Chemicals Co., a div. of Union Carbide & Carbon Corp., Dept. CP, 30 E. 42nd St., New York 17, N.Y. . . . or for more information check CP 5214 on form opposite last page.)



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When inquiring check CP 5215 opposite last page

No. 1 in a series

Successful Uses of QO THFA®

(TETRAHYDROFURFURYL ALCOHOL)

ESTER QUEST YIELDS A NONVOLATILE HERBICIDE

(Photos courtesy of California Spray-Chemical Corporation)

Typical agricultural application of an Ortho* herbicide

Company: California Spray-Chemical Corporation, Richmond, California, makers of Ortho* herbicides.

Problem: To produce a nonvolatile herbicide that clings to brush and weeds until they're killed and control possible vapor injury to adjacent sensitive crops.

Solution: 2,4-Dichlorophenoxyacetic acid (2,4-D) and 2,4,5-trichlorophenoxyacetic acid (2,4,5-T) are converted to tetrahydrofurfuryl alcohol esters which have low volatility and contain maximum percentages of 2,4-D and 2,4,5-T components for effective herbicidal activity.

End Product: A nonvolatile, effective herbicide that stays put longer.

Side Benefits: (1) THFA is easy to esterify and handle. (2) The resulting THFA esters of 2,4-D and 2,4,5-T are easily soluble in the majority of organic solvents and insoluble in water.

Check Into THFA yourself. Its successes are numerous. THFA is a versatile solvent for many resins and dyes, a useful chemical intermediate and finds a large market in the synthesis of plasticizers for vinyl resins.

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In Europe: Quaker Oats-Graanproducten N. V., Rotterdam, The Netherlands; Quaker Oats (France) S. A., 3, Rue Pillet-Will, Paris IX, France; A/S "Ota", Copenhagen, S. Denmark
In Australia: Swift & Company, Pty., Ltd., Sydney
In Japan: F. Kanematsu & Co., Ltd., Tokyo

inquiring check CP 5216 opposite last page

MATERIALS

First bulletin of a series on odor masking agents

Four-page folder is first of a series of bulletins that will deal with different segments of the perfume and aerosol industry. Bulletin No. One discusses masking odors of aerosol insecticides containing Lethane, Chlordane, Methoxychlor, Malathion, Pyrenone, Sulfoxide, Thanite, or Strobane. Bulletins are 7 x 10″ in size and are punched for notebook insertion.

Bul No. 1 is issued by Aerosol Dept., Dodge & Olcott, Inc., Dept. CP, 180 Varick St., New York 14, N.Y. When inquiring reader may simply check CP 5217 on form which is located opposite last page.

Exceptionally high purity and heat stability found in epoxy intermediate . . .

bisphenol A also makes oil-soluble phenolics

Uses: As an intermediate for oil-soluble phenolic resins and for epoxy resins. Big use for the epoxies is in making surface coatings that have outstanding durability, moisture and alkali resistance. Epoxies also go into structural laminates, high-strength adhesives, and plastic stamping dies.

Features: Compound has exceptionally high purity and excellent heat stability.

Description: Bisphenol A (*p,p′*-isopropylidene diphenol) is supplied as white flakes that solidify in the 150-155°C range. At 4 mm (Hg), boiling point is 220°C. Practically insoluble in water, flakes are soluble in alcohol and acetone. Of high purity, compound has this typical analysis:

Free phenol (%)	0.30
Moisture (%)	0.2
Ash (%)	0.02
Iron (ppm)	30

Color of a 5% solution in 2B alcohol is 30 APHA.

(Bisphenol A is a product of Organic Chemicals Div., Monsanto Chemical Co., Dept. CP, 800 N. 12th Blvd., St. Louis 1, Mo. . . . or for more information check CP 5218 on form which is located opposite last page.)

Correction Notice

In the new chemical listing carried in April CP, Item 207, page 46, a product of Becco Chemical Div., Food Machinery and Chemical Corp., was erroneously shown as hydrogen peroxide crystals. The hydrogen peroxide is, of course, a liquid, which is purified to 99.6% H_2O_2 by a crystallization process.

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Amorphous Elemental Boron has moved out of the laboratory into full commercial production. The proved uniformity and high purity of Trona's elemental boron undoubtedly has an application in your research, development or manufacturing program. You are invited to avail yourself of the experience and specialized knowledge gained in the production of 90% (plus) pure Boron by the world's largest producer of this vital chemical element.

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New York 16, New York

Write SALES DEVELOPMENT DEPARTMENT

When inquiring check CP 5220 opposite last page

Inaugurates series of quarterly descriptive product folders

Six-page, pocket-size folder is first of quarterly series devoted to manufacturer's products. First bulletin includes Nopco GS-10, a hydroxylated aliphatic amide with properties similar to glycerine; Nopco 1525-L, a nonionic surface-active agent; Nopco 2221-P, a modified ester of castor oil; and Nopcoset B, a modified polyvinyl acetate emulsion of the anionic type.

"Nopco News" is issued by The Industrial Market Development Dept., Nopco Chemical Co., Dept. CP, 1st & Essex Sts., Harrison, N.J. When inquiring specify CP 5221 on form opposite last page.

Here are two iron phosphates for use in pharmaceuticals and foods as sources of iron . . .

both compounds surpass requirements of all Federal and state food laws

Uses: For use in pharmaceutical industry for iron enrichment of vitamins and for fortifying foods.

Features: Iron phosphates surpass the requirements set forth by all Federal and state food laws.

Description: Ferric ortho phosphate assays 28.0-30.0% iron and 38.5-41.0% P_2O_5. Packed bulk density is 0.25-0.50 gm/cc. Comes in two color grades: a white powder and a light tan powder.

Sodium ferric pyrophosphate assays 15.5-16.5% iron and 50.5-52.5% P_2O_5. Bulk density is 1.4-1.6 gm/cc. This is particularly recommended for foods that are susceptible to rancidity.

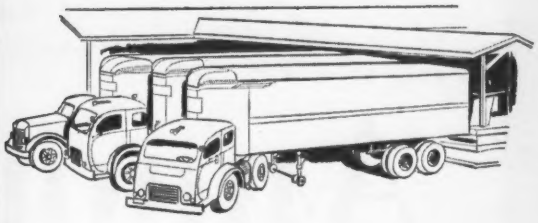
(Iron phosphates are products of Joseph Turner & Co., Dept. CP, Ridgefield, N.J. . . . or for more information check CP 5222 opposite last page.)

Physical properties of alloys included in data sheets

Series of data sheets covers chemical and physical properties, typical analysis, and uses of manufacturer's chemicals, metals, and alloys. Chemicals covered include: potassium titanium fluoride, potassium zirconium fluoride, and potassium fluoroborate. Master alloys described are: titanium-aluminum, titanium-boron-aluminum, boron-aluminum, and zirconium-aluminum.

Technical Data Sheets on the above compounds are available from Kawecki Chemical Co., Dept. CP, 220 E. 42nd St., New York 17, N.Y. When inquiring specify CP 5223 on form opp. last page.

Roy Fruehauf, President, Fruehauf Trailer Company



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Announcing

Expanded Rare Earths and Thorium program

of Davison Chemical and Rare Earths, Inc.

Davison Chemical Company, Division of W. R. Grace & Co., and Rare Earths, Inc., Pompton Plains, N. J., a wholly-owned subsidiary of Grace, have joined in a program of expanded production, sales, research and development of thorium, cerium and other rare earths compounds.

Rare Earths, Inc., organized in 1947 for the production of Rareox, an optical quality cerium oxide polishing powder, has diversified into thorium, cerium and other rare earth chemicals. Now, additional facilities are being installed at Davison's Curtis Bay (Baltimore) plant. This means added service plus intensified research and development.

Current applications, in addition to thorium as a potential source of atomic energy, are glass polishing, glass coloring and decolorizing, as a component in carbon arc electrodes, in lighter flints, and for ferrous and non-ferrous metallurgical alloys.

Rare Earths, Inc., an affiliate of Davison Chemical Company, Division of W. R. Grace & Co., offer a quality line of thorium and rare earth chemicals. Contact your Davison Sales Office for additional information on these interesting and useful products.

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Division of W. R. Grace & Co.

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Producers of: Catalysts, Inorganic Acids, Superphosphates, Triple Superphosphates, Phosphate Rock, Silica Gels, Silicofluorides. Sole producers of DAVCO® Granulated Fertilizer.

When inquiring check CP 5225 opposite last page

Revised data on properties, uses for gold bronze, Al powders

Data sheets cover revised and expanded information on properties and uses of gold bronze powders, aluminum pigments, and aluminum grain. Typical uses are given for industrial finishes, paint, varnishes, lacquers, lithography, and paper coatings.

"Properties and Uses of Aluminum Pigments, Aluminum Grain" and "Properties and Uses of Golden Bronze Powders" are available from Metals Disintegrating Company, Inc., Dept. CP, 1170 Arthur Blvd., Elizabeth B, N.J. When inquiring specify CP 5226 on form opposite last page.

Prevents formation of scum and dirt in continuous peroxide bleaching of cotton goods . . .

dispersant speeds action of caustic, helps remove foreign material in subsequent wash

Uses: To eliminate staining and resist spots that are often caused by redeposition of dirt and insoluble materials on cotton goods during continuous peroxide bleaching.

Features: Besides elimination of staining, dispersant prevents formation of scum and dirt in both the caustic and peroxide saturator. Caustic action is speeded up and foreign material is more thoroughly removed in subsequent wash. Maximum penetration and reaction of peroxide with coloring matter in the goods is assured. Insoluble silicates and phosphates are kept from accumulating on equipment.

Description: Dispersant is a phosphated compound. In the caustic saturator as little as 0.25-0.5% speeds caustic action. About 0.1-0.5% is used in the peroxide saturator.

(Barisol BRM is a product of Dexter Chemical Corp., Dept. CP, Blvd. PO Box 1, New York 59, N.Y. . . . or for more information check CP 5227 on form opposite last page.)

Uses and test data on $LiOH \cdot H_2O$

Describes use of Trona lithium hydroxide monohydrate in making multi-purpose grease in four-page bulletin. Test information is given, as are suggested uses in other industries.

Service Bul 1L is issued by American Potash & Chemical Corp., Dept. CP, 3030 W. Sixth St., Los Angeles 54, Calif. When inquiring specify CP 5228 on form opposite last page.

Accepts use of plasticizer for synthetic films for food packs . . .

acetyl triethyl citrate is solvent plasticizer for cellulosics, is toxicologically safe

Uses: As a solvent plasticizer for the cellulosic family of plastics, especially cellulose acetate. In addition to their use in making packaging material for both fatty and non-fatty foods, cellulosics are used to make coatings for cartons and toys.

Features: Three government agencies, the Food and Drug Administration, the Meat Inspection Branch of the USDA, and the Quartermaster Food and Container Institute, have accepted use of this product as a plasticizer for synthetic films used as food packaging material. Plasticizer has superior toxicological safety.

Description: Acetyl triethyl citrate is an odorless product derived from citric acid.

(Citroflex A-2 is a product of Chas. Pfizer & Co., Inc., Dept. CP, 630 Flushing Ave., Brooklyn 6, N.Y. . . . or for more information check CP 5229 on form opposite last page.)

Offers standardized stable substrate for ribonuclease activity

Barium salt of cytidine-2′:3′-cyclic phosphate (CNC) is chromatographically homogeneous and is offered as a standardized stable substrate for ribonuclease activity. CNC permits precise comparisons of ribonuclease activity in normal and neoplastic tissue and other biological samples. It is a starting point for cytidine diphosphates and branched nucleotide phosphate esters.

(CNC is a product of Schwarz Laboratories, Inc., Dept. CP, 230 Washington St., Mt. Vernon, N.Y. . . . or for more information check CP 5230 on form opposite last page.)

On the use of Hycar latices in textile industry

Hycar latices are used in textile finishing and processing to improve physical properties and increase sales appeal. A 16-page bulletin tells all about it. Test data, curves, properties, and application details are given.

Service bul H-20 is issued by B. F. Goodrich Chemical Co., a div. of B. F. Goodrich Co., Dept. CP, 324 Rose Bldg., Cleveland 15, Ohio. When inquiring specify CP 5231 on form opposite last page.

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When inquiring check CP 5232 opposite last page

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Check the drawings (above) for typical applications. Use it as a guide to uncover new profitable uses for Quick-Seal couplings in your plant.

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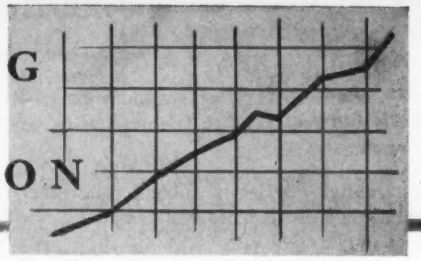
Titeflex Quick-Seal Couplings • *leakproof at all operating pressures, in every application*

When inquiring check CP 5233 opposite last page

EXPANDING CHEMICAL PRODUCTION



Acetylene chemistry gets boost

Acetylene unit, using the BASF (Sachsse) process, starting with natural gas, will be built by Rohm & Haas Co. in Houston, Texas. Company's major use for acetylene is in synthesis of acrylate monomers, intermediate materials in manufacture of plastics, paint emulsions, other products. Ammonia and methanol units will also be built to use the by-product gases to advantage. Capacities of the ammonia and methanol units will supply most of Rohm and Haas' internal requirements for these materials.

Boosting capacity again at Seadrift, Texas

State of Texas will be providing 65 million pounds more of ethylene glycol for automobile anti-freeze when Carbide & Carbon's unit is completed at the Seadrift, Texas plant. Capacity for ethylene oxide is also being boosted to more than 200 million pounds per year at this plant. Completion of the new facilities are expected by the fall of 1956. Ethylene oxide is the source for ethylene glycol, diethylene glycol, triethylene glycol, acrylonitrile, ethanolamines, and glycol-ethers.

Will use improved process for PE production

Construction has already started of a new plant at Fords, N. J. for production of pentaerythritol. Annual capacity of the Heyden Chemical Corp. plant will be 25 million pounds. An improved process will be used to provide flexibility in producing any grade or type of pentaerythritol. Process was developed after several years of intensive lab, pilot plant, and field development work.

This plant is Heyden's fourth major expansion in the pentaerythritol field since 1939.

Contact sulfuric acid plant to use roaster gas

Raw material for a 100-ton-per-day contact sulfuric acid plant of Kennecott Copper Company, Hayden, Arizona will be roaster gas from roasting operations. Design and equipment will be supplied by Chemical Construction Corporation.

Will spend five million dollars on cement capacity

Boosting capacity of its Harleyville, S.C., portland cement plant by 60%, Giant Portland Cement Company will add facilities to produce an additional 1,100,000 barrels per year. Cost will be approximately five million dollars. Since the new capacity will be an addition to an existing unit, cost will be substantially less than cost of a new plant of similar capacity. Production is expected from this unit early in 1957.

Building small epoxy unit for development resins

Shell Chemical Company has built a resin unit at its Houston, Texas, plant to manufacture market-development quantities of epoxy resins. Plant began production in April. It will produce developmental resins and curing agents for customers' experimental use and small commercial production.

Richfield Oil adds units to recover sulfur

Two units will be added by Richfield Oil Corporation at the Watson Refinery, Wilmington, California, to recover hydrogen sulfide. Units are a diethanolamine regeneration unit and a water reclaiming unit. Cost will run approximately ½-million dollars.

News about chemical materials in the US – *plant construction, increased production . . . on stream now or planned for future*

Another carbon black plant for Phillips Chemical

Expanding demand for carbon black has caused Phillips Chemical Company, subsidiary of Phillips Petroleum Company, to begin construction of a 64 million pound per year carbon black plant in the Gulf Coast area. Plant will produce special carbon blacks for manufacture of automobile tires. Phillips already has carbon black facilities near Borger, Texas, with a capacity of 290 million pounds per year.

Kaiser spending eight million for chlorine and caustic

With a capacity of approximately 40,000 tons of caustic soda and 36,000 tons of chlorine per year, Kaiser Aluminum's caustic-chlorine plant at Gramercy, La. will cost approximately 8 million dollars.

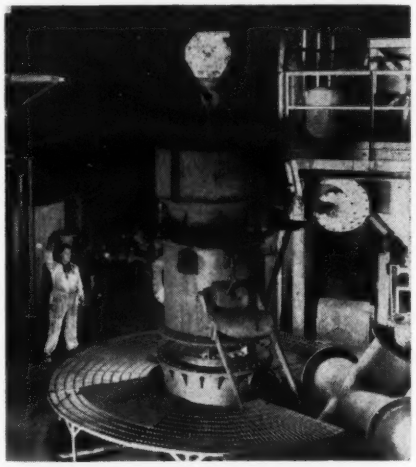
Plant is part of Kaiser Aluminum's $400 million expansion program and will produce caustic by electrolytic reduction of salt in diaphragm cells. The Gramercy unit will be part of company's projected alumina plant which will have a capacity of 500,000 tons per year.

Acquires land on Houston channel for industrial plants

Approximately 950 acres, with frontage on the ship channel near Houston, Texas, has been acquired by Phillips Petroleum Company for industrial sites. Company is developing sites on the acreage for sale to others as plant locations. Phillips is developing this location to provide additional markets for Phillips' natural gas, natural gas liquids, chemical intermediates derived from petroleum. Phillips plans pipeline distribution of natural gas, ethylene, brine, and other materials for industrial plants at this location.

Raising titanium capacity to 6000 tons annually

Titanium sponge production will be expanded at Henderson, Nevada, plant of Titanium Metals Corporation of America. Capacity will be increased from 3600 to 6000 tons annually. At the same time, ingot-melting facilities will be expanded to meet the additional production. Titanium Metals is jointly owned by National Lead Company and Allegheny Ludlum Steel Company. New capacity, including chlorinators as in

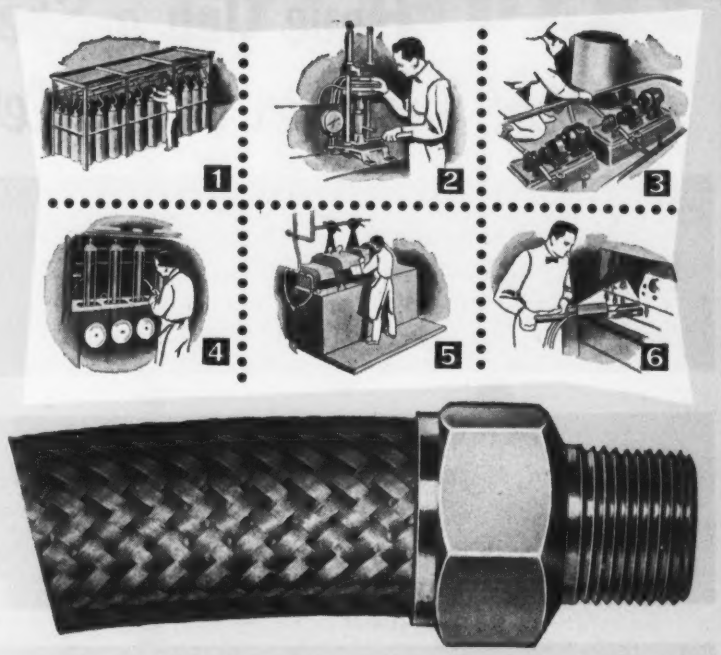


photograph, is expected to come into production during 1956. Since titanium ingots produced at Henderson are processed into mill products at Allegheny Ludlum plants, increased ingot production will require new installations at Allegheny finishing mills.

GAF completes acetylene plant — to build oxide operation

Manufacture of high-pressure acetylene products was begun by General Aniline & Film Corporation at a commercial-sized plant in Calvert City, Kentucky. Operation

(*Please turn to next page*)



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Here's the hose that licks critical corrosion, temperature, vibration and pressure problems in conveying gases, liquids, lubricants. *Universal* applications. All-metal construction. Braided or unbraided. Alloys to meet *every* need.

Investigate. Check the drawings (above) for ideas in the use of Titeflex Flexible Metal Hose in your plant. Use coupon to obtain information about this versatile and durable all-metal hose.

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When inquiring check CP 5234 opposite last page

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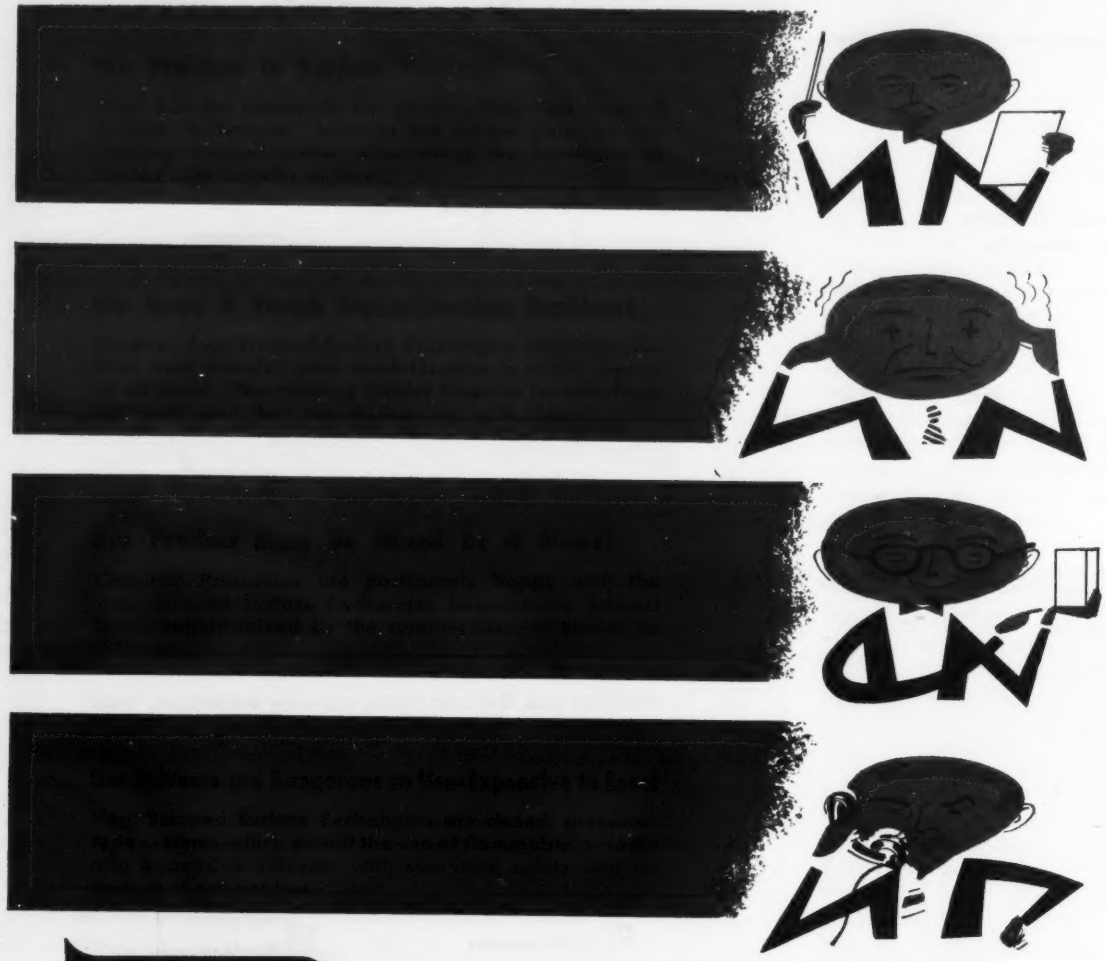

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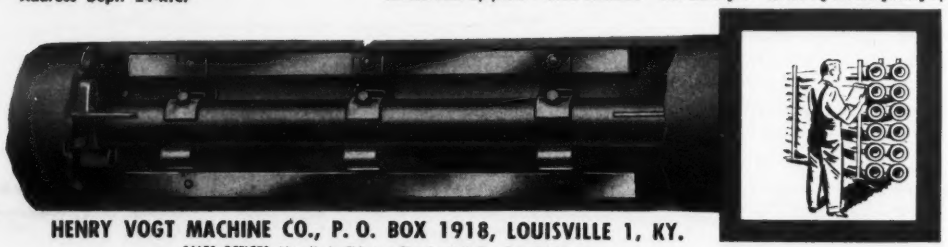

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When inquiring check CP 5235 opposite last page

Expanding Chemical Production

(*Continued from preceding page*)

is the result of 14 years of research, pilot plant production, and market development. Cost of installation was $6 million. One major product of the plant will be polyvinyl pyrrolidone (PVP). Plant is integrated and capable of being expanded rapidly for production of each individual item.

Although the plant will concentrate initially on products related to the PVP family of acetylene derivatives, plans allow for production of vinyl alkyl ethers, esters, and their polymers which are now under commercial development.

General Aniline & Film Corporation also plans to build an $8-million ethylene oxide and ethylene glycol plant in Linden, N.J. These facilities will be located at the existing Dyestuff and Chemical Division plant. Ethylene oxide from the plant will be used primarily in production of company's own detergents and surfactants. Ethylene oxide productive capacity will be 60-million pounds a year. Design and engineering will be by Scientific Design Company.

$10-million ammonia plant goes on stream

With a design capacity of 300 tons per day, ammonia plant of Sun Oil Company at Marcus Hook Refinery, now on stream, is largest in United States to operate on by-product hydrogen from petroleum operations. This $10-million plant will supply anhydrous ammonia for both industry and agriculture. Sale of Sun's ammonia is expected to be about 75% to industry and 25% for agriculture, just the reverse of the national average.

Sun's plant will use by-product hydrogen from two Marcus Hook Houdriformers. Anhydrous ammonia is second non-hydrocarbon product to be produced at the Marcus Hook refinery. First was elemental sulfur, on which production started last fall.

Ferro color division will expand

Including a new building and equipment, expansion program of the Ferro Corp. Color Division will cost approximately $240,000. Addition will increase laboratory and manufacturing area to over 60,000 square feet.

Koppers builds more plants for polyethylene

With completion of a plant for production of conventional polyethylene, Koppers Company plans construction of two low-pressure polyethylene plants. One plant will be located in Los Angeles; the other in Woodbridge Township, Middlesex County, N.J.

Los Angeles plant will be constructed and operated as a joint venture by Koppers Company, Inc., and Brea Chemicals, Inc. It should be in operation by June, 1957, and will consist of two major units: one manufacturing ethylene from refinery gas, and the second processing ethylene into low-pressure polyethylene under the Ziegler process license. Capacity of the Los Angeles plant will be approximately 60 million pounds per year. Refinery gas for manufacture of ethylene will be supplied by Union Oil's Los Angeles refinery.

New Jersey plant is to be operated by the Koppers Chemical Division. Capacity there will be 30 million pounds per year. This operation will also be under the Ziegler process license.

Diamond to expand capacity for perchlorethylene

Diamond Alkali Company's Deer Park plant capacity for perchlorethylene will expand. Plant is located at Houston, Texas. Capacity will be doubled — expansion is expected to be completed by January, 1957.

Complete installation will include new office building, laboratory, warehouse, plus facilities for loading barges in addition to the necessary process equipment. Multi-million dollar project will be designed to allow future expansion.

Large increase of facilities for polyethylene

Substantial increase in capacity of Tenite polyethylene manufacturing facilities of Texas Eastman Company, a division of Eastman Kodak Company, is on the way. After additional equipment has been placed in operation at Longview, Texas, new capacity will be 40,000,000 pounds annually. Texas Eastman has plans to produce a new series of formulas of Tenite polyethylene with greater clarity and stiffness.

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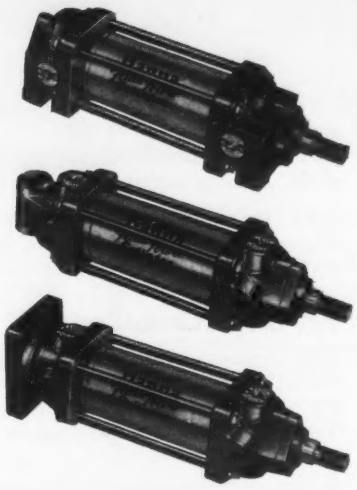
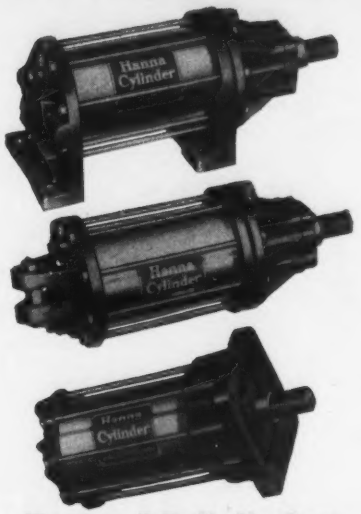
HANNA AIR and HYDRAULIC CYLINDERS



Hanna T750 Fluid Power Cylinders
Air Operation to 250 psi, Hydraulic Operation to 750 psi
Write for Catalog 750A



Hanna LP Cylinders
Air or Hydraulic Operation to 110 psi
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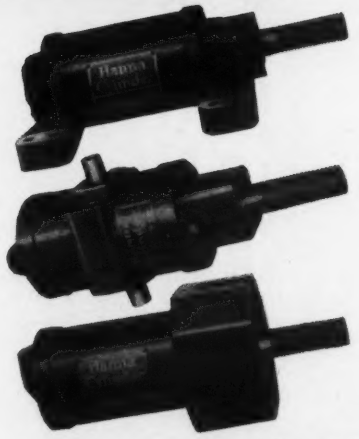
■ "Good things come in small packages," it is said . . . so do Hanna Cylinders . . . and in medium and large packages, too. From the complete Hanna Cylinder line, up to 1,500 psi capacities, you can select a standard size and mounting style, with the power and stroke you need, to exactly suit your applications. Of course, you will be sure it's the finest cylinder for the job—because it's a Hanna. Well over fifty years of design and manufacturing experience guarantee that.

So, when you need reliable cylinders for products you make for resale, or for use in your own plant, consult a Hanna representative, or call on our plant engineers to help you find the most efficient answer to your problem. Also write us for technical literature.



Hanna HP Cylinders
Hydraulic Operation to 1,500 psi
Write for Catalog 2338

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When inquiring check CP 5236 opposite last page

In 1940, the Petro-Chem Development Company lined their first Iso-Flow furnace with B&W Insulating Firebrick. Today, over 1200 installations later, (some with fluid outlet temperatures over 1600F) not a single furnace has ever been shut down because of the need for refractory maintenance.

Long life is just one reason furnace builders, as well as furnace operators, insist on B&W IFB. Here are four more:

CUT INSTALLATION COSTS

B&W Insulating Firebrick are easy to install. They can be cut, drilled or shaped on the job with ordinary woodworking tools. Their lightness makes them easy to handle.

ELIMINATE EXPENSIVE ALLOYS

Because of their high insulating values, B&W Insulating Firebrick can be supported or anchored with ordinary carbon steel. Expensive, heat-resisting alloys are not necessary.

REDUCE DOWN-TIME

These brick have low heat storage, cool off quickly. This makes possible quick access to the furnace for inspection. They heat up quickly to get back on the line, too.

CLOSE TEMPERATURE CONTROL

Due to the low heat-storage capacity of B&W IFB, their hot-face temperature responds quickly to changes in the rate of heat input to the furnace — insuring the closest possible temperature control.

You, too, can profit by this four-way economy of B&W Insulating Firebrick. Ask your B&W representative for all the facts on these cost-cutting refractories. He'll be glad to discuss your refractory problems with you.

BABCOCK & WILCOX
THE BABCOCK & WILCOX CO.
REFRACTORIES DIVISION
GENERAL OFFICES: 161 EAST 42ND ST., NEW YORK 17, N.Y.
WORKS: AUGUSTA, GA.

B&W REFRACTORIES PRODUCTS — B&W Allmul Firebrick • B&W 80 Firebrick • B&W Junior Firebrick • B&W Insulating Firebrick B&W Refractory Castables, Plastics and Mortars • OTHER B&W PRODUCTS—Stationary & Marine Boilers and Component Equipment... Chemical Recovery Units... Seamless & Welded Tubes... Pulverizers... Fuel Burning Equipment... Pressure Vessels... Alloy Castings

R-448

When inquiring check CP 5237 opposite last page

Expanding Chemical Production

(*Continued from preceding page*)

Startup polyvinyl unit ahead of schedule

Du Pont's production of polyvinyl alcohol will be doubled with the startup of a unit at Niagara Falls, N. Y. Former operation was unable to keep up fully with orders because of capacity limits. Plant makes five grades of polyvinyl alcohol used in manufacture of adhesives, textile sizes and finishes, paper sizes and coatings, synthetic sponges, and as an emulsifier in making polyvinyl acetate emulsions for paints.

Will build $10 million plant to handle plastic demand

Demand for thermoplastic products of Marbon Chemical Division of Borg-Warner has initiated construction of a $10 million plant at Washington, W. Va. The material, called Cycolac, is now being produced by Marbon's two plants at Gary, Indiana. Plant will consist of a series of individual buildings dispersed for maximum safety. A substantial section will be devoted to facilities for processing the synthetic resin into a variety of colors. Cycolac is a high-impact thermoplastic resin.

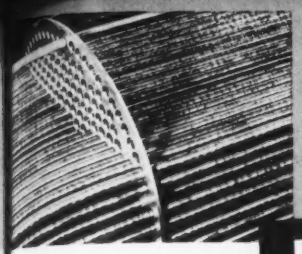
Develops phosphorus process with lower cost

Victor Chemical Works has worked out method to increase phosphorus output of their electric furnaces *with lower costs*. Engineering plans are being formulated for an eighth phosphate plant at a new location. Victor also plans production of potassium polyphosphate at Chicago Heights, Illinois, and will increase research facilities there by 50%. Expansion program will require two to three years to complete.

Tripling isocyanate capacity as fast as possible

Mobay Chemical Company plant, completed during February, 1956, will be tripled in size rapidly as engineering and construction can be completed. When expansion is completed, the plant will be the largest in the United States for production of isocyanates

(*Please turn to page 67*)



STARTLING APPLICATIONS OF INCREASED HEAT TRANSFER

Using WOLVERINE TRUFIN* Type S/T

• CONDENSING STRAIGHT RUN GASOLINE

Located in the plant of a large Mid-West refinery this condenser, originally a plain tube unit, was retubed with Wolverine Trufin Type S/T. Here are the basic facts:

	PLAIN TUBE	TRUFIN TYPE S/T
TOTAL TUBE LENGTH	16,384	10,916
OUTSIDE SURFACE, SQ. FT.	3,215	5,420
METAL	14 BWG Admiralty	16 BWG (Cat. No. 195065) 90-10 Cu. Ni.

RESULTS:

The heat duty of the Trufin-tubed unit was 630,000 BTU's per hour greater than the plain tube condenser. Trufin's performance per foot of length, was 80% greater than the plain tube. In nearly two years of service, the Trufin unit has never required mechanical cleaning. Acidizing every four months has been adequate.

CONCLUSION: *Trufin is a Wise Buy!*

• CONDENSING ORGANIC CHEMICALS

The following data is based on the condensation of Freon-12 with water and was compiled after exhaustive tests under closely controlled conditions:

	PLAIN TUBE	TRUFIN TYPE S/T
SHELL SIZE O. D.	12¾"	12"
TUBE LENGTH	7'	7'
TUBE SPECIFICATIONS	⅝" O.D.—18 BWG 90-10 Cu. Ni.	⅝" O.D.—18 BWG (Cat. No. 195049) 90-10 Cu. Ni.
OUTSIDE SURFACE SQ. FT.	143.34	334.0

RESULTS:

On the basis of equivalent water velocity the prime surface unit extracted 411,000 BTU's per hour. The Trufin-tubed unit obtained 829,000 BTU's per hour.

CONCLUSION: *Trufin is a Wise Buy!*

• CONDENSING CRACKED GASOLINE

When tubed with plain tube, this superstructure mounted condenser, had to be mechanically cleaned every three months. In an effort to boost capacity, extend on-stream time, and eliminate the necessity of designing new exchangers, it was retubed with Wolverine Trufin Type S/T. Here are the vital statistics:

	PLAIN TUBE	TRUFIN TYPE S/T
NO. OF TUBES	500	500
OUTSIDE SURFACE AREA, SQ. FT.	1522	3280
METAL, ¾" O. D.	16 BWG Admiralty	16 BWG (Cat. No. 195065) Admiralty

RESULTS:

Heat duty jumped from 3,960,000 to 5,820,000 BTU's per hour with the Trufin bundle. Retubing permitted a 38% increase in throughput and a 47% increase in heat removal with a very large increase in length of run.

CONCLUSION: *Trufin is a Wise Buy!*

These are but three of many installations where Trufin is injecting greater performance into existing equipment. When retubing existing condensers or designing new ones, always specify Trufin Type S/T. For further information complete with case histories and design data, write for your copy of Wolverine's Trufin Opportunity Book. Do it today!
WOLVERINE TUBE, 1469 Central Avenue, Detroit 9, Michigan.

*REG. U.S. PAT. OFFICE

PLANTS IN DETROIT, MICH. AND DECATUR, ALABAMA.
SALES OFFICES IN PRINCIPAL CITIES
EXPORT DEPARTMENT, 13 EAST 40TH ST., N.Y. 16, N.Y.

DIVISIONS OF CALUMET & HECLA, INC.
CALUMET DIVISION
WOLVERINE TUBE DIVISION
CANADA VULCANIZER & EQUIPMENT CO., LTD.
FOREST INDUSTRIES DIVISION
GOODMAN LUMBER CO.

WOLVERINE TUBE
Division of Calumet & Hecla, Inc.
Manufacturers of Quality-Controlled Tubing and Extruded Aluminum Shapes

STARTLING FACTS ABOUT HEAT TRANSFER

Where and how WOLVERINE TRŮFIN* Type S/T Can Help You CUT COSTS, BOOST PERFORMANCE!

CHECK LIST
OF TRUFIN TYPE S/T ADVANTAGES THAT WILL HELP YOU SAVE

Trufin—with fins squeezed directly from the tube wall—has more than twice the heat transfer surface of plain tube. You need less tube because Trufin transfers more BTU's per foot of tube!

Fewer tubes mean smaller shells, headers, baffles . . . substantial savings in material requirements!

Less tubes mean less holes to drill—fewer rolling-in operations . . . a direct saving in time and labor costs!

Trufin requires much less over-all tube metal to transfer a given heat load. This means a real saving when expensive alloys are necessary . . . vital when alloys are in short supply!

Because Trufin installations require fewer tubes you can often design lighter units. Think of what this means when superstructure mounting is required!

Maintenance costs go down and stay down. Replacement tube costs are reduced, on-stream time increases because fewer tubes mean less cleaning time is necessary. Actual operating data shows that Trufin withstands fouling for longer periods of time than does prime surface tube. Operating time between change-overs is lengthened!

Trufin is completely interchangeable with prime surface tube. You follow standard retubing techniques!

Trufin withstands vibration, sudden temperature changes and pressure variations. Fin life is equal to that of the tube itself.

On the left, below, you'll find some basic reasons for the outstanding performance of Wolverine Trufin Type S/T—the integral finned condenser tube. You'll also find, below, a partial list of operations where Trufin can be used to good advantage. Study both lists carefully—check them against your own heat exchange operations—see for yourself just where and how Trufin can help you do a better job.

A FEW OF THE APPLICATIONS WHERE TRUFIN TYPE S/T CAN HELP YOU

- In Butane Condensers
- In Propane Condensers
- In Gasoline Condensers
- In Isopropyl Condensers
- In Condensing Butyl Heads
- In Gas Coolers
- In Condensing Organic Chemicals
- In Boiling Hydrocarbons
- In Heating or Cooling Gases
- In Heating or Cooling Oil or other liquid Hydrocarbons

As we have said—study these points. They can be your check list to greatly increased efficiency and economy in your heat exchange applications. Wolverine's new Process Flow Sheet Book contains many drawings of actual Trufin installations. Write today for your copy. WOLVERINE TUBE, 1469 Central Avenue, Detroit 9, Michigan.

Wolverine Trufin available in Canada through the Unifin Tube Company, London, Ontario.

*REG. U.S. PAT. OFFICE

565W42—5106

DIVISIONS OF CALUMET & HECLA, INC.
CALUMET DIVISION
WOLVERINE TUBE DIVISION
CANADA VULCANIZER & EQUIPMENT CO., LTD.
FOREST INDUSTRIES DIVISION
GOODMAN LUMBER CO.

WOLVERINE TUBE
Division of Calumet & Hecla, Inc.
Manufacturers of Quality-Controlled Tubing and Extruded Aluminum Shapes

PLANTS IN DETROIT, MICHIGAN, AND DECATUR, ALABAMA. SALES OFFICES IN PRINCIPAL CITIES.
EXPORT DEPARTMENT, 13 EAST 40TH STREET, NEW YORK 16, NEW YORK

(*Continued from page 66*)

and polyesters, two major ingredients used in manufacture of urethanes.

The New Martinsville, W. Va., plant now has a monthly capacity of several hundred tons of isocyanates and comparable amounts of polyesters. Urethane products are used as flexible and rigid foams, magnet wire coatings, paints, adhesives, and synthetic rubbers. Flexible foams are already marketed in applications as automobile crash pads and sun visors, carpet underlay, clothing inner-liners, and upholstery. Rigid foams have been used in manufacture of aircraft parts.

Hercules to use Swiss process for methanol

For first time in the United States the Swiss Inventa process is being put to work by Hercules Powder Company. Hercules will build a methanol plant at Louisiana, Missouri. Cost will be in excess of $2 million; capacity, seven million gallons of methanol annually. Plant will be constructed on site where Hercules now produces 40,000 tons of anhydrous ammonia a year.

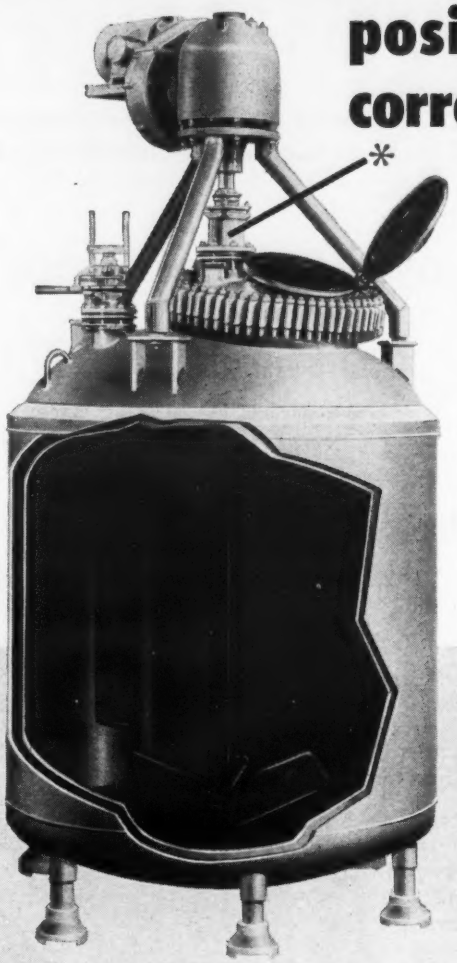
Hercules is also building a pentaerythritol and formaldehyde plant at this location. Approximately two-thirds of the methanol productive capacity will be used by Hercules in production of formaldehyde for polyethylene.

Anhydrous ammonia plant for Lake Charles

Petroleum Chemicals, Inc., owned jointly by Continental Oil Company and Cities Service Company, plans to construct a $12½-million anhydrous ammonia plant at Lake Charles, La. Product will be used principally as a fertilizer. Plant will produce 100,000 tons of ammonia annually. Construction is scheduled for completion in the fall of 1957. By-product hydrogen, principal raw material for ammonia, is to be supplied by Continental and Cities Service refineries near Lake Charles.

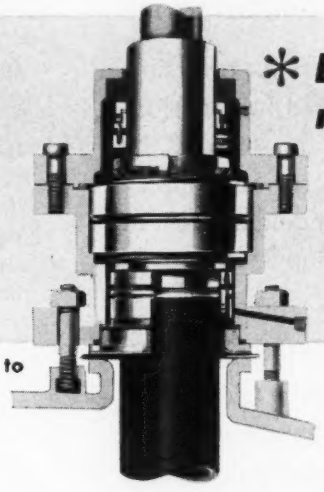
For more information on product at left, specify CP 5238 . . . see information request blank opposite last page.

Glascote glass-lined reactors give you more years of positive protection against corrosion and contamination



• In corrosive processes, you'll find Glascote's glass-lined heavy-duty reactors provide extra years of productive, trouble-free service. And product purity is assured — ever free of metallic contamination because Glascote's highly chemical-resistant, acid-alkali glass offers great versatility of products to be processed. Glascote also gives you non-stick glass for polymer production, such as polyvinyl chloride, polyvinyl acetate and synthetic rubber. (*Glass-lined* storage vessels are also offered for both types of processing.)

Glascote can meet your specifications for large, heavy-duty reactors. Complete line is equipped with exclusive leak-proof mechanical seal, agitator and baffle . . . in capacities up to 4000 gallons and larger. Internal and jacket pressures to meet your specifications.



* Exclusive rotary mechanical seal

Glascote's exclusive rotary, mechanical seal design provides two major advantages to users of glass-lined equipment requiring either high pressure or vacuum. (1) Eliminates leakage under pressure (toxic or explosive conditions), and reduces maintenance. (2) Permits efficient use of higher operating pressures and prevents contamination of vessel contents.

Outstanding features include glass-coated gland insert, glass-coated agitator shaft, and Teflon packing.

Our standard one year guarantee continues to apply to all Glascote glass-lined products.

Glascote®
PRODUCTS, INC.

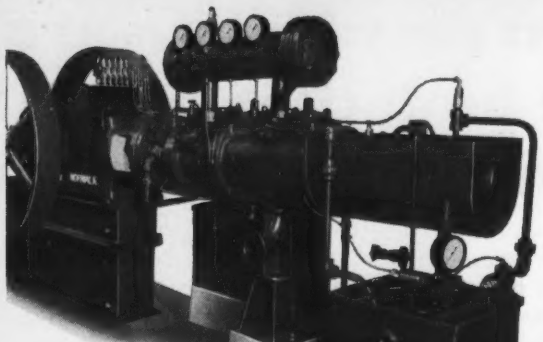
Sales offices or agents located in
New York • Philadelphia • Union, N. J. • Chicago • Cleveland
Dayton • Houston • Los Angeles
Export Sales: A. O. Smith Corp., International Division, Milwaukee 1, Wis.

Ask the representative who calls on you for all the facts about Glascote products — reactors, storage tanks, columns, conical rotary dryer-blenders, receivers, condensers and accessory products. Or, if you prefer, write direct. Glascote Products, Inc., Cleveland 17, a subsidiary of A. O. Smith Corporation.

A subsidiary of A.O.Smith Corporation

World's largest manufacturer of glass-lined steel products

When inquiring check CP 5239 opposite last page



5 Stage
NORWALK
COMPRESSOR

built for economical performance

Frames with taper roller bearings, reversible ring plate valves, force feed lubrication, generous intercooler coils are some of the features that make this horizontal duplex compressor compact, sturdy, and efficient to operate. Its five stages develop 7500 pounds pressure.

Every Norwalk compressor is test-run for eight hours at the factory, then taken down for complete inspection before re-assembly and shipment. Complete catalog describing compressors from single stage to six stages available on request.

NORWALK COMPANY, INC.
SOUTH NORWALK, CONNECTICUT
Makers of high pressure compressors since 1864

When inquiring check CP 5240 opposite last page

**Chemical industry continues expansion in South —
Escambia Bay installation now on stream is . . .**

Florida's first synthetic NH_3 plant

Uses potassium carbonate absorption system for removing carbon dioxide from process gases

Completed in a record eight-month period, new multi-million dollar Escambia Bay Chemical Corporation plant is aimed at supplying an eight-state Southern market with anhydrous ammonia and ammonium nitrate fertilizers. Located 20 miles north of Pensacola on Escambia Bay, plant is first of its kind in Florida. Using the Nitrogen Engineering Process (based on Haber-Bosch method), plant's giant converter is designed to produce sufficient ammonia to give a net production of not less than 200 short tons per 24 hours.

The plant is the first of its kind in the US to use a potassium carbonate absorption system for removing carbon dioxide from process gases prior to conversion into ammonia. This is reported to result in a steam savings of 20,000 to 25,000 lb per day as compared to conventional monoethanolamine absorbers having same capacity. The carbonate absorption can be regenerated by heating.

Other improvements incorporated in the plant include reforming natural

Escambia Bay Chemical Corporation's tower can produce 350 tons ammonium nitrate prills per day

gas under pressure, use of gas turbines in the nitric acid unit to reduce power requirements, and a catalytic combustion system to minimize air pollution by nitric oxides.

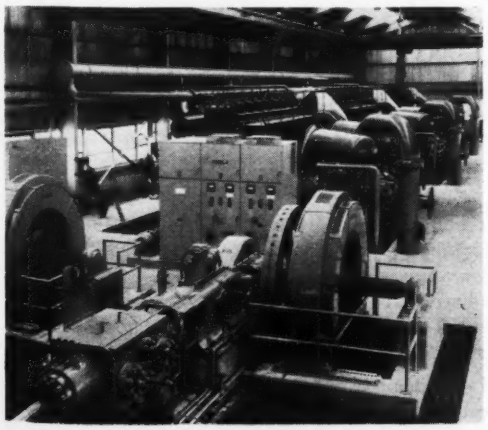
Manufacturing facilities provide for daily production of 200 tons of anhydrous ammonia, 220 tons of 100% nitric acid produced as a 56% aqueous solution, 275 tons of 100% ammonium nitrate produced as an 83% aqueous solution, and 350 tons of ammonium nitrate prills. Ammonia is produced from natural gas, water, and air. Nitric acid is made by oxidation with air of a portion of the anhydrous ammonia production. The ammonium nitrate is produced by neutralizing the nitric acid with an additional portion of the anhydrous ammonia production.

Water for plant is obtained from three wells, approximately 300 ft deep, each with a capacity of 1000 gpm. Plant will consume about 150,000-kw electricity per day. Power is being supplied by the local Gulf Power and Light Company. Natural gas for use in process and steam generation is purchased from the United Gas Corporation.

Escambia Bay Chemical Corporation was formed in 1954 by United Gas Corporation, Shreveport, La.; Electric Bond and Share Company, New York, N.Y.; and the National Research Corporation, Cambridge, Mass. The new facility is employing approximately 200 persons.

Also under construction adjacent to the installation, is a polyvinyl chloride resin plant. Designed to produce 30 million pounds per year, unit is scheduled for completion by the end of 1956.

(Escambia Bay Chemical plant was engineered and constructed by Chemical Construction Corporation, Dept. CP, 483 Madison Avenue, New York, N.Y.)



Four-stage compressors compress purified hydrogen and nitrogen gases to 5200 psi

Protect Plant and Equipment with

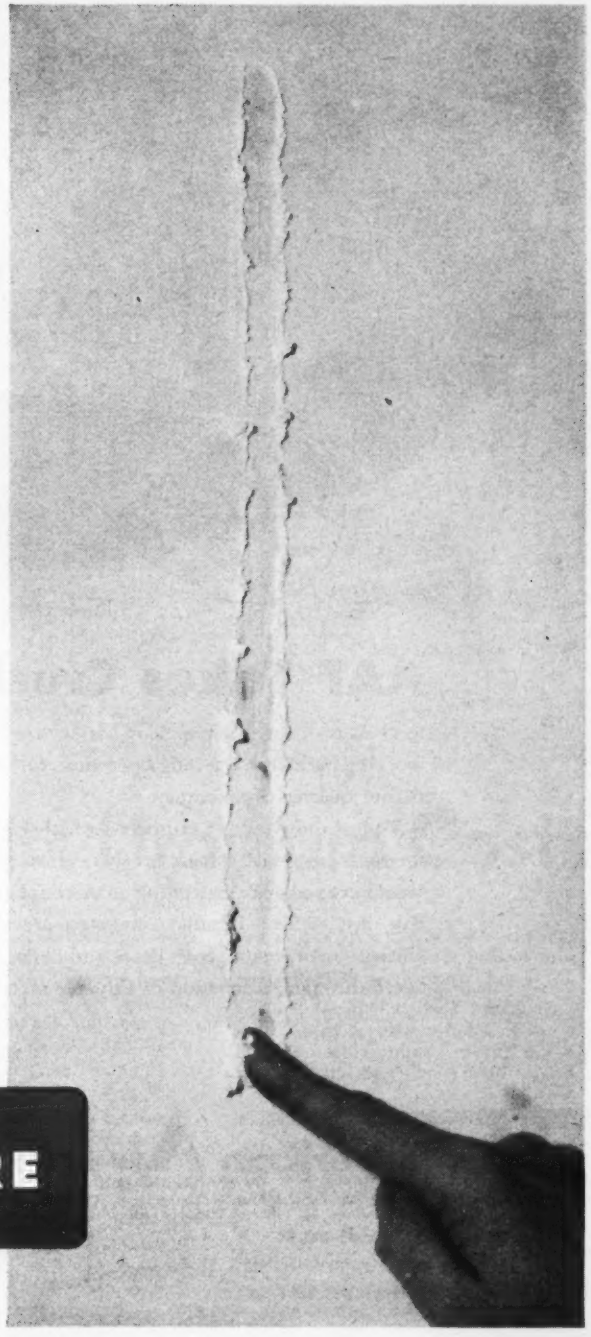
TYGON "ATD" *Hot Spray* PAINT

and save three ways:

1. **Lower Applied Cost**
2. **Less Down Time**
3. **Longer Lasting Protection**

It takes thickness in a paint film to give effective, long lasting protection against chemical attack. Corrosion engineers call it the "magic five mils." But to obtain a 5 mil film with conventional cold spray paints means four to five coats, with eight to ten hours drying time between.

But Tygon "ATD" Hot Spray builds the magic five mils in just two slow passes of the spray gun. Labor costs are cut 20%-30%. Down time is held to a minimum. And you get all of the protection against corrosive attack for which Tygon plastic is famous.

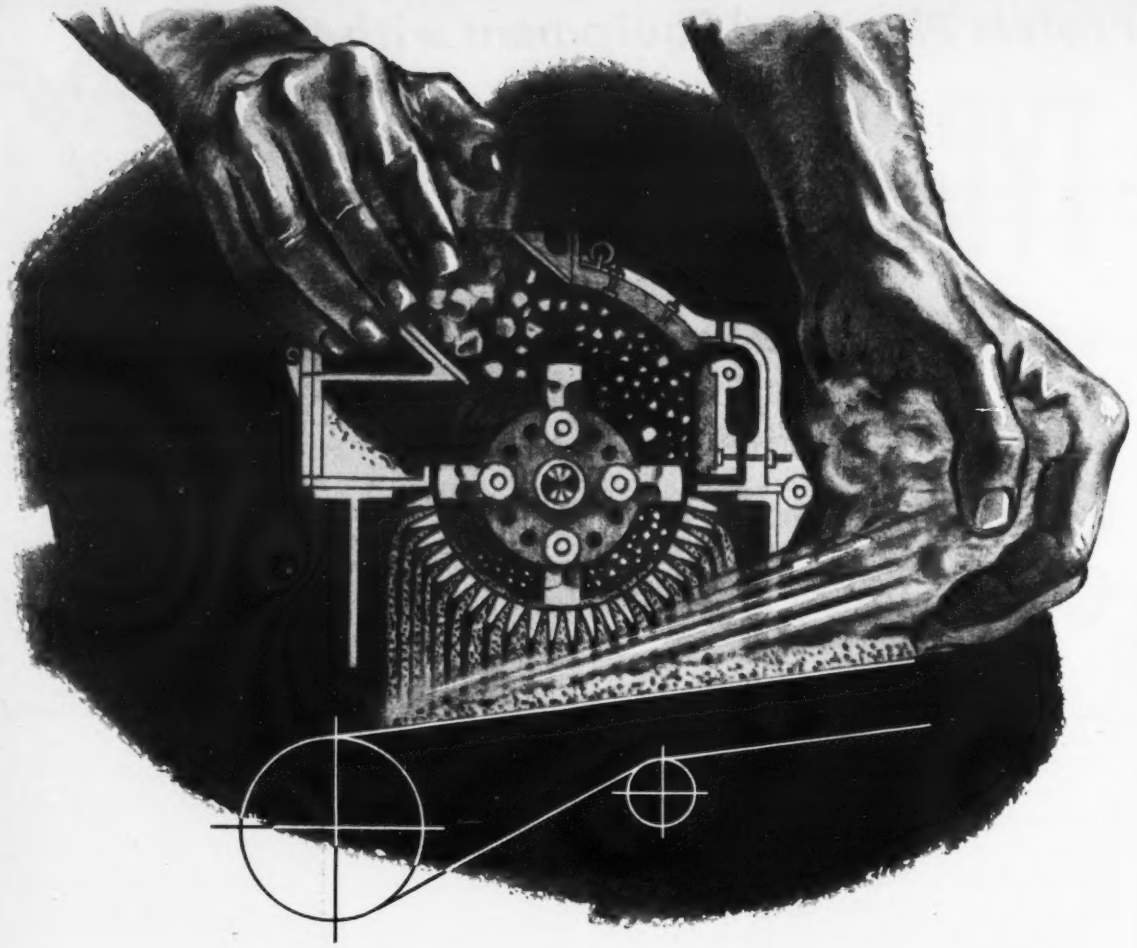


Write for the
TYGON COATING MANUAL
This "just-off-the-press" manual is filled with data to make your battle against corrosion easier.

PLASTICS AND SYNTHETICS DIVISION
U. S. STONEWARE
AKRON 9, OHIO

New York 154E Chicago Houston

When inquiring check CP 5241 opposite last page



AAF Takes Crushing Dust in Hand

AAF Dust Control equipment has been a vital working partner in crushing operations for more than a quarter of a century.

Today, thousands of crushers—whether hammermill, jaw, mill, impact breaker, gyratory, or what have you—are depending on AAF for effective dust control. Results: employees are more efficient, maintenance costs drop, and dollars are saved through reclamation of valuable material.

AAF's experience penetrates every industry, includes every type of dust. This reflects in the complete product line which includes dynamic precipitators, hydro-static precipitators, dry centrifugals and fabric arresters. For practical help with *your* dust problem, call your local AAF representative or write us direct.

ROTO-CLONE AMERclone AMERjet Dust Control Equipment

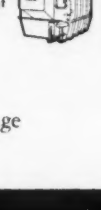
AAF Filters and Precipitators

Illinois Steam Heating Specialties

American Air Filter
COMPANY, INC.
258 Central Avenue, Louisville 8, Kentucky
American Air Filter of Canada, Ltd., Montreal, P. Q.

BETTER AIR IS OUR BUSINESS

AAF Dust Control Equipment



Herman Nelson Industrial Heaters

When inquiring check CP 5242 opposite last page

Acid, caustic handled safely with non-slip gloves at battery plant

Non-slip grip industrial gloves, with curved fingers which provide flexibility, are being used to advantage at Sonotone Corporation, Port Chester, N.Y., in the manufacture of batteries. Gloves permit employes to handle acid and caustics safely while doing their jobs fast and efficiently.

Operator removes nylon battery frames from corrosive cleaning solution prior to rinsing

Gloves protect hands of employe filling cells of completed battery wih potassium hydroxide

In manufacturing the sintered-plate nickel cadmium batteries, quantities of potassium hydroxide and nitric acid are used. The vinyl-coated gloves are interlock knit-lined, have excellent durability and abrasion resistance. This type was selected as being the most suitable for the particular operations at the plant.

(VL-34 Stanflex industrial gloves are product of Pioneer Rubber Co., Dept. CP, Willard, Ohio . . . or for more information check CP 5243 on form opposite last page.)

Plant cools and heats building with process cooling water at almost no cost . . .

cold well water pumped through air conditioning system in summer

Personnel in the new building at Cowles Chemical Company, Skaneateles Falls, New York, enjoy the advantages of year-around air conditioning at practically no expense to the company. Credit for this pleasant state of affairs goes to the plant engineering department, which designed the system. Engineers found that they could use their 50°F well water for warm weather cooling before it was pumped to the production process for use as coolant.

In winter, the opposite procedure is followed. The water, which is heated to about 120°F in the process, is then used to heat the building. The plant produces Drymet, the trade name for Cowles' anhydrous sodium metasilicate. Product is made in special furnaces, parts of which require cooling during high temperature fusing of soda ash and sand. The water is used as cooling medium here.

Conditioned air for offices

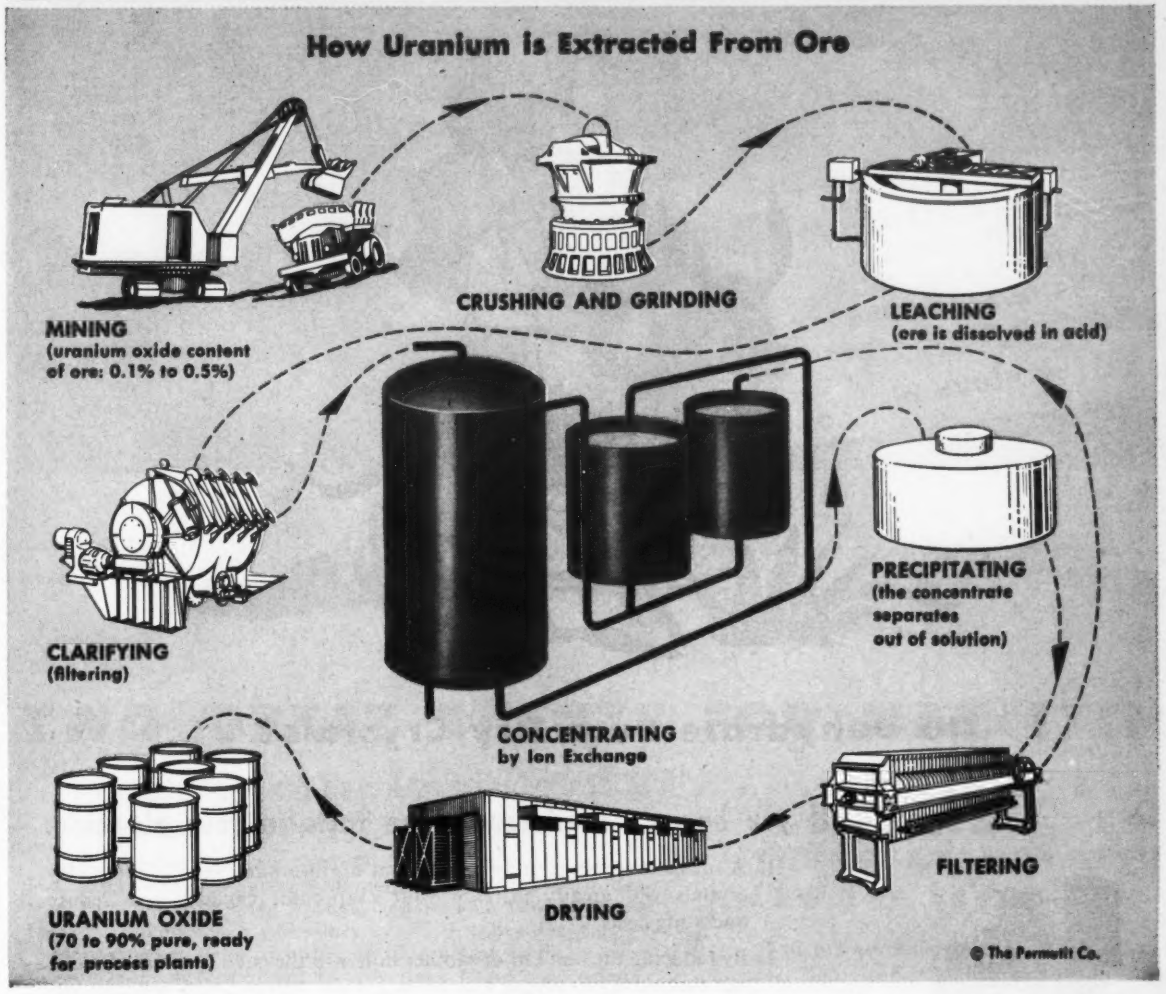
Air conditioning for the offices is provided by a Climate Changer air handling unit, which incorporates filters, mixing box, heating and cooling coils, humidifier, and fan. Outside ventilation air and recirculated air are mixed in this unit and then passed through the coils for heating or cooling to the desired temperature. This conditioned air is then discharged at the rate of 9000 cfm into a duct system for distribution throughout the occupied area.

Fan-Coil UniTrane room air conditioning units are used in the instrument room, balance room, library and private offices. Supplied with cold or hot water according to season, these individually controlled units maintain conditions to suit the desires of room occupants. Adjustments made on one unit have no effect upon performance of the rest of the system. A separate air handling unit supplies conditioned air to the research space, analytical rooms, and other areas of the laboratory section.

In use for over two years, results show that the heat absorbed by the water in the air conditioning system is not enough to interfere with the manufacturing operations in any way. Also, during cold months, there has been no occasion when heat was required to augment that supplied by the process furnaces.

(Air conditioning units used in the system were supplied by The Trane Company, Dept. CP, La Crosse, Wis. . . . or for more information reader may simply check CP 5244 on the Reader Service slip which is located opposite last page.)

PROCESSES: Ion exchange "swaps" chemicals in solution at high speed . . . purifies, recovers, concentrates, separates. An example:



Ion Exchange Cuts Uranium Costs

One reason uranium is costly is because it's spread so thin. Even a ton of good ore contains only 10 lb. of uranium oxide. And when that ton of ore is dissolved, its 10 lb. of uranium is hidden in 5 *tons* of leach solution!

• **Solutions that dilute** would be almost too expensive to handle if it weren't for the ability of ion exchange to pick out "the needle in the haystack." Take the above example . . . ion exchange-precipitation takes the 10 lb. of uranium out of the 10,000 lb. of leach solution in one simple step . . . then delivers it in as little as 12 lb. of concentrate! It also discards other elements that generally stick close to uranium . . . eliminating special up-grading steps. The results: *more* uranium per ton of ore and at a lower cost than by former methods . . . and *higher grade* uranium that cuts subsequent refining costs.

• **That's why Permutit** ion exchange is at work at African, Canadian and U. S. uranium mines.

• **This compact process** also concentrates metals from industrial wastes. For example, it recovers valuable chromium from exhausted plating baths and rinse waters and, at the same time, eliminates a tough and costly waste disposal problem. It recovers copper and zinc from rayon wastes. It also removes unwanted minerals and other impurities from process and boiler feed water, chemicals, sugar solutions and hundreds of other products.

• **We'll be glad** to look into ways it might apply to your process. Write to The Permutit Company, Dept. CP-5, 330 W. 42nd St., New York 36, N. Y.

PERMUTIT®
rhymes with "compute it"
ION EXCHANGE for Water Conditioning
Chemical Processing • Industrial Waste Treatment

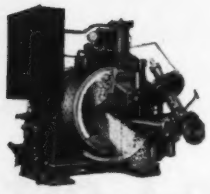
When inquiring check CP 5245 opposite last page

Are You Carrying an Extra Burden

to Dehydrate Pure Dry Crystals?

If you haven't considered these facts in your planning:

1. A substantial reduction in the amount of rinse water required to purify crystals will greatly increase your evaporator capacity and reduce operating costs.
2. By reducing the amount of mother liquor in the cake by 50% or more, the cost of finish-drying will be materially reduced and dryer capacity increased.



A PROVING GROUND FOR BETTER PROCESSING

Sharples maintains a completely equipped centrifugal test laboratory for industry. Any of the nine basic types of Sharples centrifuges can be applied to your problems under conditions which closely parallel plant operating conditions. You are invited to make use of these exceptional facilities.

Then you can't afford not to look into the Sharples Super-D-Hydrator.

It will cost you nothing to get the profit-making facts, backed up by more than 400 Super-D-Hydrators at work in industry today. We will be glad to send a copy of Bulletin 1257 as a first step to discuss your objectives.

SHARPLES

THE SHARPLES CORPORATION
2300 WESTMORELAND STREET • PHILADELPHIA 40, PENNSYLVANIA
NEW YORK • PITTSBURGH • CLEVELAND • DETROIT • CHICAGO • NEW ORLEANS • SEATTLE • LOS ANGELES • SAN FRANCISCO • HOUSTON
Associated Companies and Representatives throughout the World

When inquiring check CP 5246 opposite last page

Demonstration plant will recover H_2SO_4 from steel mill waste pickling liquors . . .

initial operation is scheduled for late summer of 1956

Eight major companies in the metallurgical industry are co-sponsoring the building and operation of a demonstration plant for regenerating waste pickling liquors from steel operations. The semi-commercial unit, rated at 650 tons sulfuric acid per year, is being erected on Republic Steel Corporation's site at Niles, Ohio, where spent acid from their Niles Works operations will be treated. Completion is scheduled for late summer 1956.

Plant will use the Blaw-Knox Ruthner process in which the entire sulfate equivalent of the waste liquor is regenerated as fresh sulfuric acid for reuse in pickling of steel. Iron in the pickle solution is recovered as essentially pure iron oxide, which is recharged to the blast furnace.

A great deal of research has been conducted on disposal and treatment of pickle liquor, volume of which is now estimated at more than 600 million gal a yr in the US. Currently, the predominant method of treatment is by neutralization of the acid content with alkalis and discharging the resultant sludge into lagoons for dewatering.

(Demonstration plant is being constructed by Chemical Plants Division, Blaw-Knox Company, Dept. CP, Farmers Bank Bldg., Pittsburgh, Pa.)

"It's a remarkably clear, concise, and well-written record of fruitless research! You should have been an author!"

Pipe layouts demonstrated with scale model kits

Representatives of a flexible pipe joint manufacturer are using scale model kits to demonstrate the many piping arrangements that can be worked out with their products. The kit includes a selection of straight and angle joints, along with various lengths of pipe and a base for mounting. Parts

All parts fit snugly together without tools

fit snugly together without tools and have been time-savers for engineers in various industries in visualizing design arrangements, to work out "movement problems", and in checking for capabilities, limitations, and clearances.

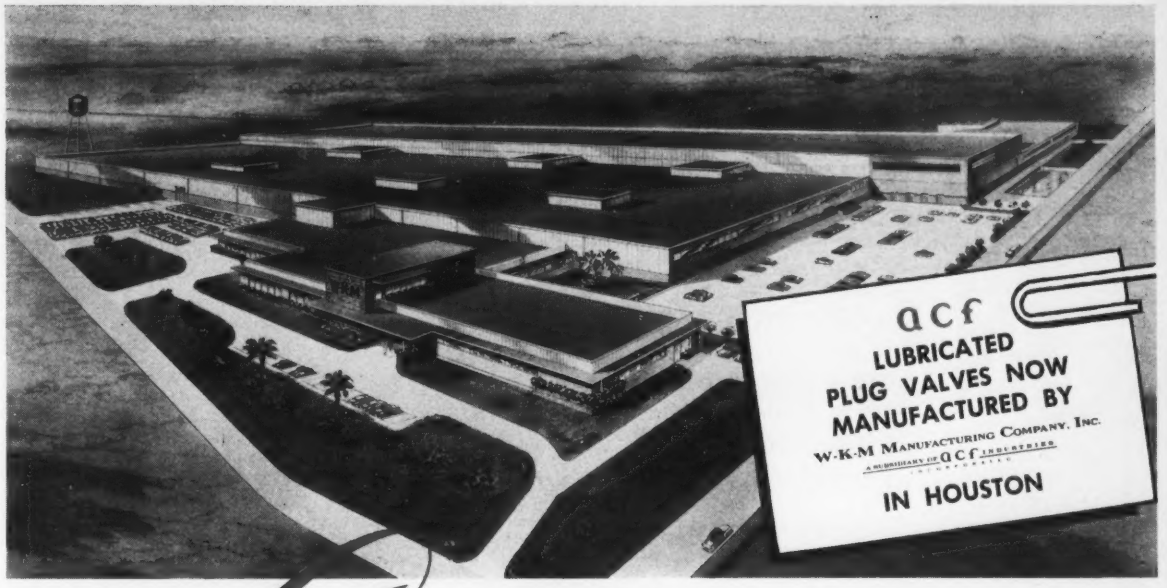
(Scale model kits are being used by Barco Manufacturing Company, Dept. CP, 500 North Hough St., Barrington, Illinois.)

Thorium's tensile strength doubled by alloying with carbon

Thorium, a metal useful as a source of fissionable uranium, can be significantly strengthened for use in nuclear reactors by alloying with carbon. Research conducted at Battelle Institute showed that carbon, as an impurity in bomb-reduced thorium, accounts for most of the difference in strength between bomb-reduced and high-purity iodide thorium.

Forty-eight elements were tried as additions to thorium, but most of them did not appreciably affect the strength of thorium when added in dilute quantities. Alloying with 0.25 weight percent of carbon, however, doubled the tensile strength. In addition, precipitation hardening and cold working further increased the strength of the thorium-carbon alloys.

(Condensed from paper presented at Nuclear Engineering and Science Congress, Cleveland, Ohio, by H. R. Ogden, R. M. Goldhoff, and R. I. Jaffee, Battelle Memorial Institute, Dept. CP, 505 King Avenue, Columbus 1, Ohio.)



Announcing

TWO GREAT EVENTS FOR MAY 17TH

THE CONSOLIDATION OF THREE GREAT COMPANIES

acf Valve Division, W-K-M Manufacturing Company, Inc., and the Key Company — all members of the acf Industrial Family — have been brought together as W-K-M Manufacturing Company, a subsidiary of acf Industries, Inc.

Management, Manufacturing and Marketing facilities of all three are now centralized in this new 12-acre completely air-conditioned office and plant at Missouri City, Texas, a few miles west of Houston.

This consolidation provides important efficiencies of production of W-K-M Through-Conduit Valves, acf Lubricated Plug Valves, Key Return Bends, and Key-Kast Welding Fittings. These products, with a long established reputation for excellent service and performance, will continue to be engineered, manufactured and sold by the same experienced personnel who were instrumental in building that reputation.

OPENING OF A GREAT NEW PLANT THURSDAY, MAY 17TH TWO to SEVEN P. M.

You are cordially invited to inspect our new Plant and Office at Missouri City, Texas, just a few miles west of Houston.

Special transportation from downtown Houston to the plant will be provided for visitors. Please write immediately for your Transportation Pass. Address W-K-M Manufacturing Company, Guest Committee, P. O. Box 2117, Houston, Texas.

W-K-M MANUFACTURING COMPANY, INC.
A SUBSIDIARY OF acf INDUSTRIES INCORPORATED
PLANT: MISSOURI CITY, TEXAS • MAILING ADDRESS: P. O. BOX 2117, HOUSTON, TEXAS

MANUFACTURING

W-K-M THROUGH-CONDUIT GATE VALVES

acf LUBRICATED PLUG VALVES

KEY RETURN BENDS AND FITTINGS

When inquiring check CP 5247 opposite last page

REDUCE YOUR
PROCESSING COSTS
WITH
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✓ CORROSION-RESISTANT
Built from time-proved stainless steel
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To fit your exact requirements
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To meet your specific processing operation
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Easy to clean and keep clean
Our technical bulletins describe this equipment in detail.
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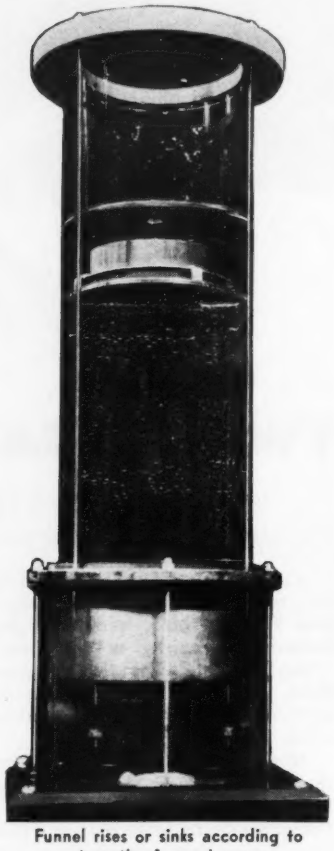
ALL LEE KETTLES ARE MADE TO A.S.M.E. CODE
When inquiring check CP 5248 opposite last page

IDEAS

Ultrasonic generator output measured by radiation pressure float

New measurement device has enabled the fast-growing ultrasonics industry to establish needed codes and standards. Known as a radiation pressure float, it provides for simple measuring of acoustic power output of ultrasonic generators.



Funnel rises or sinks according to strength of sound waves

Unit consists of a small cone-shaped inverted funnel with hollow walls. When submerged in a liquid that is being agitated by sound waves, funnel rises or sinks according to strength of waves. This enables engineers to take a reading very much in the same manner as a gasoline service station attendant using a hydrometer to check anti-freeze or battery-acid density.

(Radiation pressure float was developed by General Electric Company, Dept. CP, One River Road, Schenectady 5, New York.)

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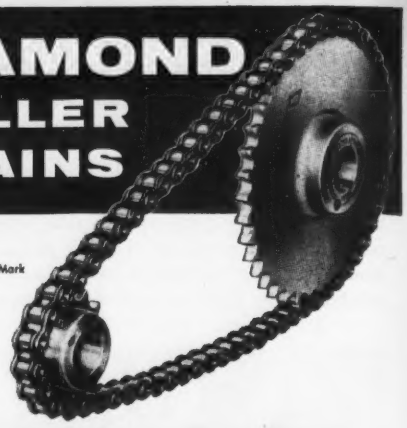
ROLLER
CHAINS
Trade ◇ Mark

Power Drives that Don't Stretch or Slip
The smooth, positive power transfer via Diamond Roller Chains, whether at high speed or low, improves performance, eliminates power waste as well as the cost and time of adjustments.
Uniformity of quality of every part and every foot is one of the outstanding Diamond characteristics that discriminating experienced engineers and production men have counted on for long years of low-cost operation.
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See headings CHAINS or CHAINS-ROLLER in classified section of your telephone directory

Catalog 754 has 64 pages of useful information. Copy on request.
When inquiring check CP 5249 opposite last page

Where can you use these high-purity chemicals?
Ammonium Paratungstate
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Potassium Silicate
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SYLVANIA
When inquiring check CP 5250 opposite last page

European technical observation plan offered by research group . . .

will set up overseas office to funnel information to group of participating companies

American companies can keep abreast of European technological developments at minimum cost if they take advantage of the service being offered to them by Armour Research Foundation. Under the program, the organization will set up a European office to funnel ideas and techniques of potential value in the American market to a group of 16 noncompeting companies participating in the plan.

Initially the office will be staffed by four engineers. Each will be assigned prime responsibility for the four sponsoring companies most closely representing his field of engineering. The engineers would attend seminars, technical meetings, conferences, and trade shows. They would arrange for invitations to visit plants and laboratories and also would review technical publications, patents, and other developments in their field.

Under the plan, a sponsoring company would obtain almost personal attention in its field and effective coverage in related fields. Participating companies are asked to sign up for a two-year contract initially, with renewal being on a yearly basis.

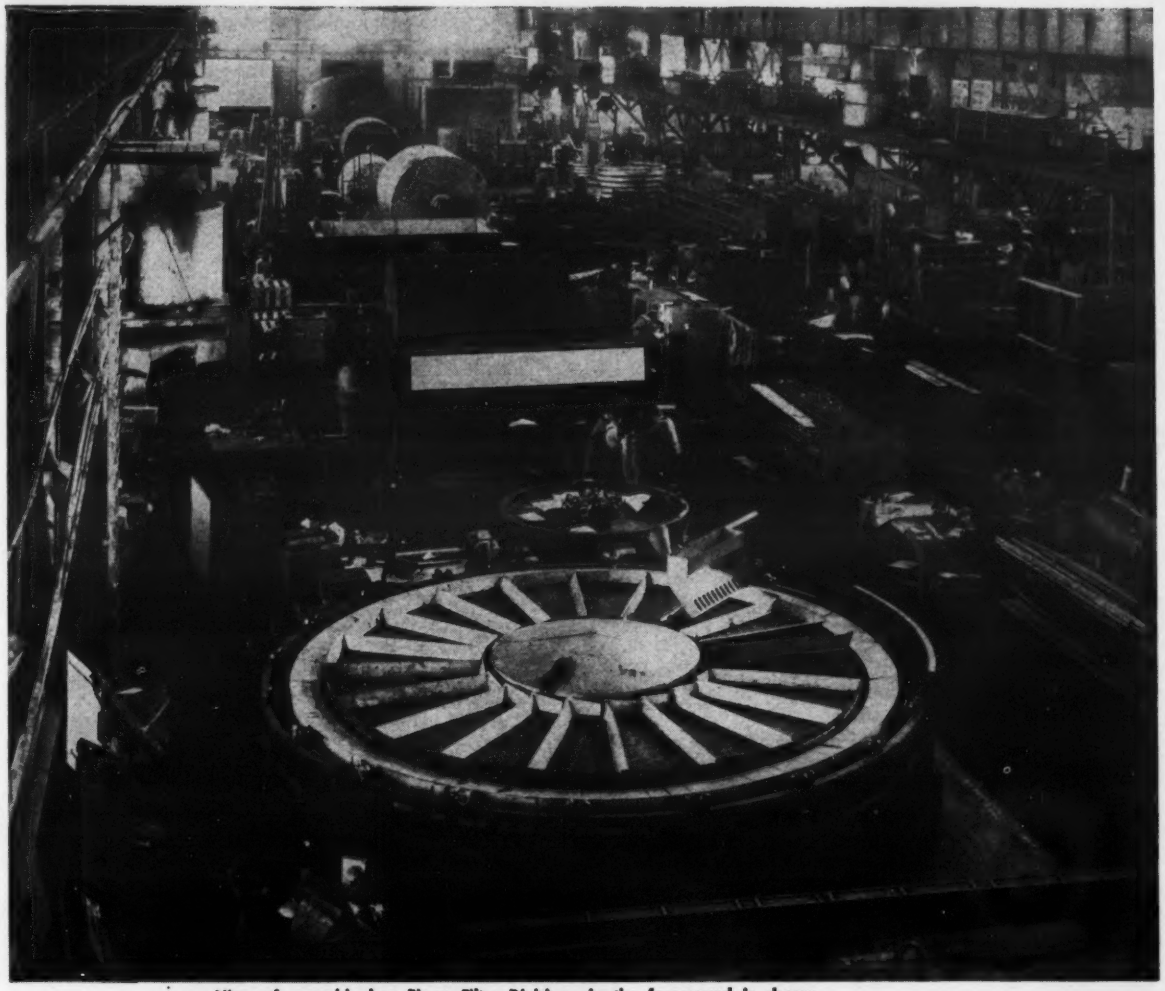
(European Technical Observation Group Plan is being offered by Armour Research Foundation of Illinois Institute of Technology, Dept. CP, Technology Center, 35 West 33rd St., Chicago 16, Ill.)

Nuclear development center to be built on 530-acre site at Windsor, Connecticut

Nuclear engineering and development center will be built by Combustion Engineering, Inc., on 530-acre site at Windsor, Connecticut. The center will comprise facilities for complete design and development of nuclear power reactors, construction of reactor cores, and for the manufacture of related atomic fuel elements.

Costing upwards of $5 million, it is scheduled to begin operations late this year. It is estimated that by 1957 the center will employ several hundred people — mostly engineers, scientists, and technicians. Stone & Webster Engineering Corporation has been engaged as architects and engineers. One of the reasons for selecting Connecticut was the large number of technical schools in the New England area, which should help in recruiting of personnel.

(Courtesy of Combustion Engineering, Inc., Dept. CP, 200 Madison Ave., New York, N. Y.)



View of assembly bay Eimco Filter Division. In the foreground is shown 120 sq. ft. pan filter, all stainless steel construction for phosphoric acid.

SPECIFY EIMCO FILTERS FOR GUARANTEED PERFORMANCE

Eimco filters are built to meet the exacting requirements of process engineers all over the world.

The wide range in types of filters available at EIMCO include both vacuum and pressure designs in: Drums, Discs, Agidiscs, Top Feed, Dewaterers and Dryers, Pans, Tubular elements and Plate and frames. Each of these designs is available with numerous attachments for cake dewatering and cake removal. Materials of construction are selected with regard to the material to be filtered.

Every filter job receives individual attention at Eimco. The Eimco filter delivered in your plant provides you with the finest filtration equipment you can buy at any price and with a machine guaranteed to perform on your product.

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B-178

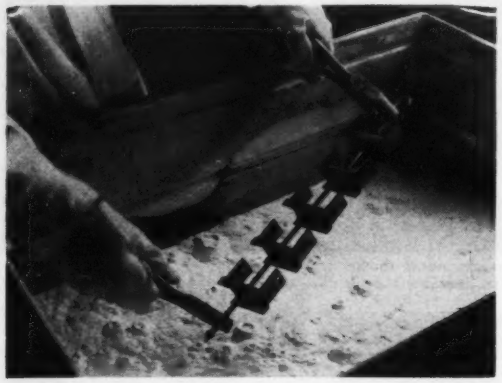
When inquiring check CP 5251 opposite last page

Process coats polymers on metal, glass, wood, and ceramics

Requires no plasticizers or solvents, uses only inexpensive equipment

New method for coating metals, glass, wood, and ceramics with various plastics has been introduced in the US. Originally invented in Germany, it has been named the "Whirlclad" process in this country. Preliminary work has been largely with nylon and low-pressure polyethylene, but other materials such as polystyrene, cellulose acetate butyrate, acrylics, and epoxy resins can also be used. Coating materials must melt sufficiently below their degradation temperatures in order to be used.

Purpose of the process is to combine the natural advantages of the polymers with those of the parent materials to be coated. Polymers are prepared in a finely divided solid form. They are



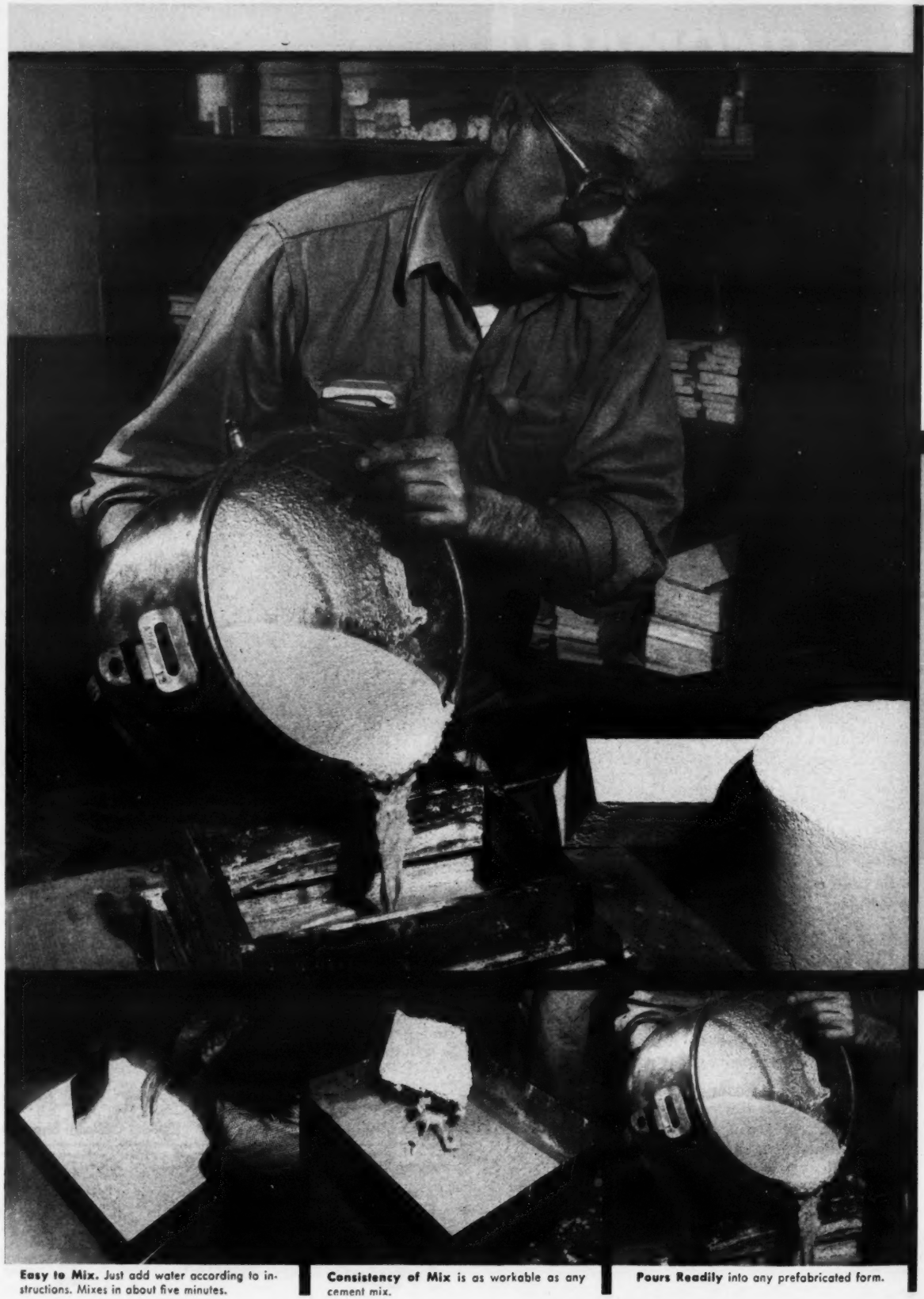
Rack of curtain slides about to be dipped into nylon. Bubbles on surface of bath are caused by ascending air used for agitation

essentially pure — containing only minor modifying agents. No plasticizers or solvents are used. Equipment is relatively inexpensive.

Coating process consists of dipping preheated articles into a fluidized bed of the plastic. Metals thinner than 0.040" are difficult to coat because they do not maintain the necessary heat during the coating process. To obtain the best adhesion, surfaces of articles being coated are roughened prior to immersion into the bath.

Coating thicknesses for nylon have ranged from 0.008" to 0.020". Polyethylene thicknesses between 0.010" and 0.040" have been obtained. Where very close tolerances or thinner coatings are desired, coatings can be machined or ground to proper dimensions.

Rectangular parts up to 37x37x76" have been



Easy to Mix. Just add water according to instructions. Mixes in about five minutes.

Consistency of Mix is as workable as any cement mix.

Pours Readily into any prefabricated form.

New ALUNDUM* 33-I insulating castable...mixes and pours like concrete...protects to 3300°F.

A New Norton Refractory Rx

Now you can protect critical areas in your furnaces and other high temperature equipment to 3300°F with ALUNDUM 33-I insulating castable — a new, easy-to-install NORTON Refractory Product.

- 33-I comes in dry form in moisture-protective bags.
- 33-I — You just add water according to instructions. Mixes readily.
- 33-I pours into any prefabricated form like a concrete mix.

And . . .

- 33-I insulates up to 3300°F.
- 33-I is light in weight and monolithic in structure.
- 33-I saves down time for repairs.

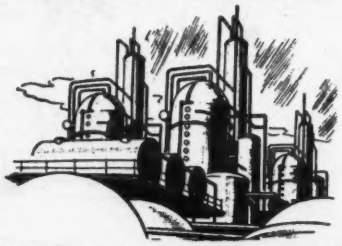
Characteristics of ALUNDUM 33-I

Density	100 lbs. per cu. ft.
Setting up time	
Stiffens	1 hr.
Initial set	4 hrs.
Final set	18-24 hrs.
Chemical Analysis — Al_2O_3	Primarily
SiO_2	< 0.1%
Fe_2O_3	< 0.1%
Maximum hot face temperature	3300°F
Water added per 100 lbs.	Approx. 4¼ gals.
Grain Size	6F

This newest Norton refractory Rx is *engineered and prescribed* for maximum protection and quick, easy installation in a wide range of uses. For further facts on ALUNDUM 33-I insulating castable, write to NORTON COMPANY, Refractories Division, 564 New Bond Street, Worcester 6, Mass. *Canadian Representative:* A. P. Green Fire Brick Co., Ltd., Toronto, Ontario.

*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries

Typical Applications in Chemical Processing



Insulation for high temperature reactors and furnaces.

NORTON
REFRACTORIES
Engineered... Rx ...Prescribed
Making better products...
to make your products better

P.O. 26R.6.10

When inquiring check CP 5252 opposite last page

coated. Equipment is being developed to handle larger items. Parts made to date with the process include valve bodies, fans, ducts, plating hooks, small containers, jigs, fixtures, rollers, bushings, sliding surfaces, appliance racks, other items.

(Whirlclad plastic coating process is being licensed in US by Polymer Processes, Inc., a subsidiary of The Polymer Corporation, Dept. CP, 126 N. 5th, Reading, Pa. Check CP 5253 opposite last page.)

Start industry-government program for the commercial evaluation of irradiated potatoes . . .

> treated product will be shipped, handled, and stored under commercial conditions

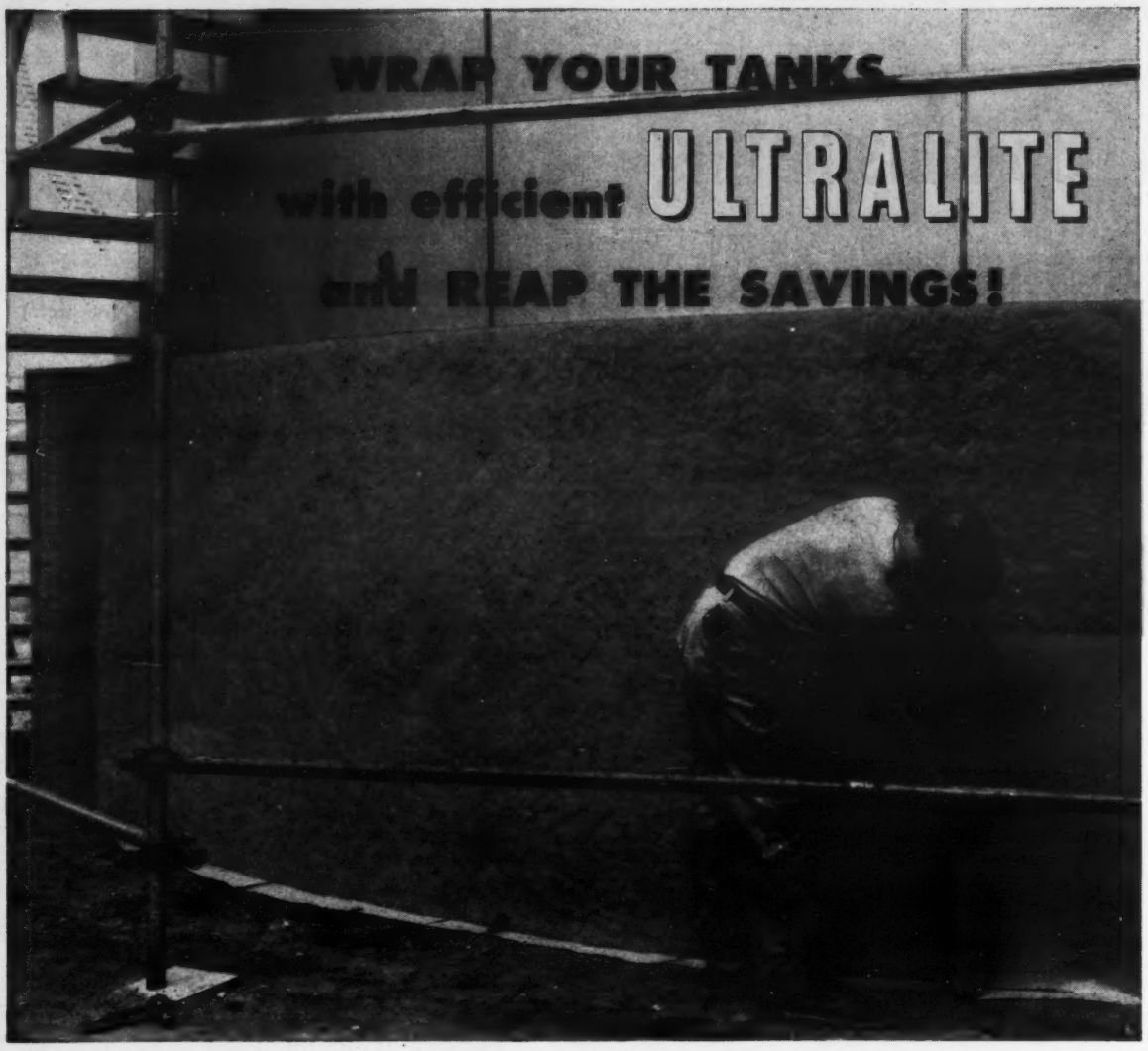
Seventy thousand pounds of potatoes are being irradiated at the AEC's materials testing reactor at Idaho Falls, Idaho, as part of an industry-government commercial evaluation program. Potatoes were selected because they are important in both civilian and military diets and because they have shown the most promise on the basis of atomic research performed to date.

Under the program, several expert groups will evaluate application of gamma radiation upon the potatoes. Comprising a selection of several varieties from both Maine and Idaho, the potatoes, before and after irradiation, will be shipped, handled, and stored under conventional conditions. Studies performed in the past at various laboratories have shown that gamma radiation will preserve potatoes for periods up to 18 months.

The program calls for six basic studies to be conducted simultaneously at several locations. Included will be extensive tests for wholesomeness based on acceptability standards recently established by the Food and Drug Administration and the Office of the Surgeon General. Other studies will investigate radiation effects upon nutrient value and physiological changes. Process costs under various shipping, handling, and storage conditions will be studied to determine impact of the "extended-storage life" upon present commercial and military markets.

Basic studies will be conducted at the Universities of Cornell, Maine, and Michigan. A wide variety of cooperating companies representing the potato processing industry will produce and examine quantities of potato chips, frozen French fries, and dehydrated, canned, and pre-peeled products made from the irradiated potatoes.

(Commercial evaluation program is being directed jointly by the Army Quartermaster Corps and AMF Atomics Inc., subsidiary of American Machine & Foundry Company, Dept. CP, 261 Madison Avenue, New York 16, New York.)



Quick as a flash, lightweight rolls of Ultralite glass fiber insulation can be run around tanks, vats and vessels — and that's more than *half* the battle in your war on insulating costs. The wider the roll, the quicker the job is done, and Ultralite is available in rolls up to *10 feet wide!*

Consider the advantages of this New Way vs. the Old Way on a tank of about 4,000 sq. ft., like the one pictured. To do the job with Ultralite required just 4½ rolls, 150′ long and in this case, 6′ wide. One man can easily carry such a roll. One man can easily apply Ultralite. But, if you were to use individual insulation bats, 24" x 96", you'd need 250 bats . . . and how many men would you say? And while you're figuring the saving, don't forget that you need twice as many welded mounting clips to apply bats as you do to apply Ultralite blankets.

Versatile and efficient Ultralite has other advantages, too, as insulation for all types of large heated equipment. It's resilient — not rigid — so that it can't crack under normal expansion and contraction. Its superior thermal efficiency means substantial heat savings over the years, and of course, Ultralite is as permanent as glass itself.

Next time, use Ultralite. It *figures.*

WRITE TODAY FOR "HOW-TO-DO-IT" DETAILS AND SPECIFICATIONS

GUSTIN-BACON *Manufacturing Company* GUSTIN gb BACON

Thermal and acoustical glass fiber insulations • Pipe couplings and fittings • Molded glass fiber pipe insulation

254 W. 10th St., Kansas City, Mo.

When inquiring check CP 5254 opposite last page

Limitless supply of industrial water scheduled for Charleston, S. C. . . .

completion of Bushy Park project will make available approximately 10 billion gal per day

Scheduled for completion by July 1956, giant water project near Charleston, S. C., will give that area one of the world's largest supplies of fresh water. Located in a booming industrial section, the project will make available for industrial use about 10 billion gallons of water per day — approximately ⅛ the total requirements of American industry. It will assure Charleston of an ample supply of water forever, according to best estimates.

The Bushy Park project will cost an estimated $4.5 million, which is exceptionally low for a water project of this size. A section of the South Carolina Low Country is being converted into a huge reservoir for storing water being discharged into the Cooper River from the Santee-Cooper hydro-electric plant 40 miles upstream from Charleston. Formerly this water was wasted. Once the water was finished making power, it flowed into Charleston harbor and out to sea.

The 10 billion gallons of water flowing daily from the plant will now be diverted into the Back River by means of a canal. The river will then be closed by an earth-fill dam at its lower end. Material used to form the dam is being dredged from the river bottom. Its composition is such that when it is exposed to air and water it acts like a natural mortar; the exposed surface case-hardens and becomes practically erosionproof. Availability of this material at the site of the dam eliminates necessity of bringing in fill material and accounts for the low cost of the overall project.

(Additional information about Bushy Park may be obtained from Bushy Park Project, Dept. CP, 89 Broad Street, Charleston, S. C.)

"Hope that's only a two-minute egg . . . I'd like some help on these alkali tests . . ."

System automatically detects moisture content of soil; turns water on, off

An automatic irrigating system that assures adequate soil moisture content at root level of crops has been developed. System not only results in water savings, but is also said to give bigger and better crop yields.

Here is how it works: A porous block containing two electrodes is buried at root level, with the lead wires coming up to the surface. Wires are brought to a central point where measuring and control equipment is located. The porous block absorbs and gives up moisture in exactly the same manner as surrounding soil.

As moisture content drops, resistance between electrodes goes up, and vice versa. Measurement of this resistance by the control equipment actuates the electric valves that control water going through system.

(Automatic irrigating system is available from Industrial Instruments, Inc., Dept. CP, 89 Commerce Rd., Cedar Grove, New Jersey.)

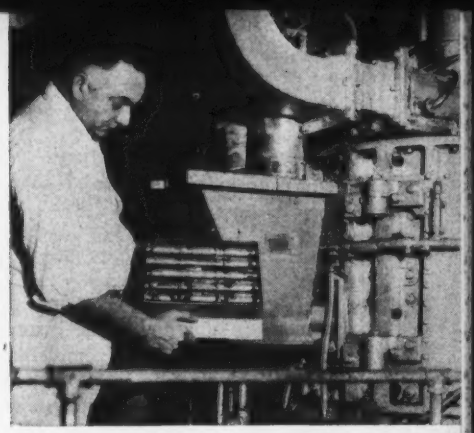
Additives up resistance of tires to ozone

Additives which improve ozone resistance of GR-S type rubber polymers as much as tenfold are described in 105-page research report. Detailed are experiments conducted for Army Ordnance Corps as part of program for improving the ozone resistance of tire stocks.

To obtain Report PB 111722, "Development of Ozone and/or Oxygen Resistant Polymers," remit $2.75 direct to Office of Technical Services, US Department of Commerce, Washington 25, D.C.

For more information on product at right, specify CP 5255 . . . see information request blank opposite last page.

OLD IRON PANTS AND THE MAGNET! A lady from yesterday with a metal-ribbed girdle wouldn't be safe next to an Eriez Permanent Magnet. She might easily be "hung up" by the powerful Alnico V action. This idea of herculean power is practically applied in industrial processing lines, where Eriez HI-POWR magnets are used to convey and control metals, and to remove dangerous tramp iron before it can cause machinery damage, fires or product contamination. *All Eriez Magnets are non-electric, self-contained. They operate without any wires or attachments. Their magnetic power is guaranteed forever. The first cost is the last.* In addition, Eriez offers a full line of HI-VI Electro Permanent Magnetic Vibratory Equipment. The heart of this unique equipment is a permanently Powered Alnico V magnetic element, which eliminates rectifiers . . . produces broader operating ranges with less power consumption . . . provides a two-way push-pull action for more productive performance. HI-VI units are lightweight, easily installed, never need realigning, have no friction-producing parts to wear, and need no lubricants.

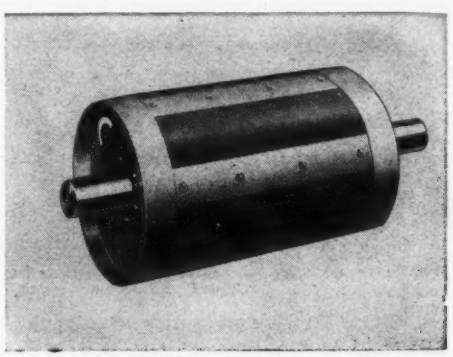


ERIEZ GRATE MAGNET DOING SWEET JOB. *Purity* is the watchword at Boweys, Inc., Chicago concern making quality chocolate powder and syrups. Fine iron contamination and an occasional nut or bolt (tramp iron) could cause product contamination and damage the mills that grind to extremely close tolerances. To protect both product and machinery, an Eriez Permanent Grate magnet was installed in the feed hopper of a Raymond mill. It has proved very efficient; the foreman insists he would not run his mills without it. Eriez Grate magnets are so successful at removing fine bits of metal from free-flowing processing lines, that a recent quality-control test by an independent laboratory showed a single Eriez magnet removed 93% of 100-200 mesh iron.

MAGNETIC IDEAS FROM ERIEZ

ERIEZ DRUM MAKES BORING JOB PAY OFF. W. F. Jobbins Co., Aurora, Ill., recently solved a problem that was both expensive and troublesome. Valuable aluminum chips were being lost in iron tailings. Previously, the tailings were collected during the week and re-run on a double deck separator on the weekend, in order to salvage the aluminum from the waste tailings. Now, with an Eriez Permanent Magnetic Drum, the tailings are so free of aluminum there's no need to re-run them. This process saves 4 to 8 man hours daily. The magnet functions so efficiently, the company reports, that loss of aluminum to iron tailings is less than lab figures show it should be! Want to know what an Eriez Drum can do for you? Request 6-page Bulletin B-601.

ERIEZ PULLEY WATCHES YOUR BELTLINE. The idea of this Eriez Magnetic Pulley is to reduce tramp iron . . . tramp iron which is hidden in wet or dry material passing on conveyor belts of rubber, leather, canvas, stainless steel, etc. Pulley sizes range from 4" to 30" diameter, in belt widths from 4" thru 72". The rugged construction and powerful magnetic strength of Eriez Pulleys give you trouble-free operation and efficient protection against tramp iron damage to costly crushers, grinders, pulverizers, stokers, etc. Want more information on this product? . . . request Bulletin 501.



ERIEZ HI-POWR MAGNETIC SEPARATOR — ERIEZ HI-VI VIBRATORY EQUIPMENT

Eriez' free booklet "Magnetic Ideas" can help you. Send for it without obligation. Address: Eriez Manufacturing Company, 73E Magnet Drive, Erie, Pa. Or, on your specific request Eriez' factory-trained field men backed by Eriez' laboratory and engineering know-how will be happy to study your particular problem, make a plant survey and offer helpful "Magnetic Ideas".

Reactor development laboratory at Battelle Memorial Institute begins operations . . .

contains about 10,000 sq ft floor space, will be used for research on power plant reactors

The second major unit in Battelle Institute's new atomic energy center has been completed. Known as the critical assembly laboratory, the new unit is being readied for study of problems in connection with design and construction of reactors for electrical power plants. It will be used also for research on atomic engines for aircraft, ships, and other means of aerial, land, and water transport. Laboratory building contains about 10,000 sq ft of floor space. A room, 40-ft square by 50-ft high, will house mocked-up reactor cores. Adjacent

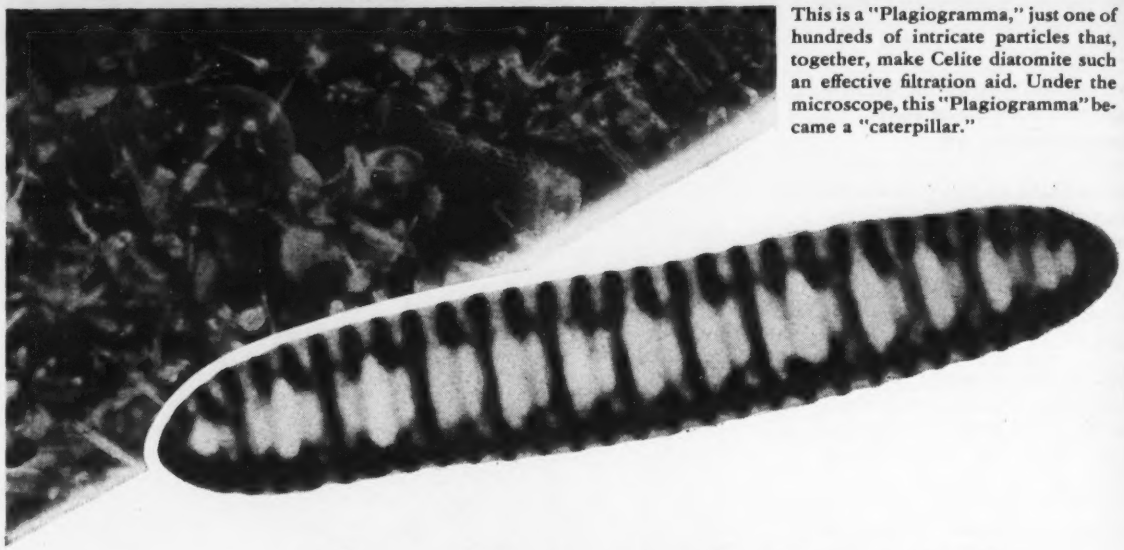
Closed-circuit television permits researchers to view reactor cores while experiments are being performed

to this room is a vault for storing fissionable material. Shielded from these areas are a control room, instrument repair and machine shops, radiation counting room, and offices.

Control apparatus for the critical assemblies was designed and built by Battelle engineers. The panel provides all controls that would be found in a power reactor station. In addition, it is equipped with a number of research circuits. Closed-circuit television has been installed, permitting researchers to view reactor cores while experiments are being performed.

Reactor room will provide enough space for mocking-up both solid-fuel and liquid-fuel reactor cores. Ample clearance is provided so that solid-fuel cores can be built with either vertical or horizontal control rods. Experimental cores mocked-up in the laboratory will contain all types of atoms and a full complement of materials needed for reactor cores capable of being operated at power levels on the order of 200,000 kw.

The first unit in Battelle's atomic research center, a hot-cell laboratory, was completed and put into



This is a "Plagiogramma," just one of hundreds of intricate particles that, together, make Celite diatomite such an effective filtration aid. Under the microscope, this "Plagiogramma" became a "caterpillar."

What's this "caterpillar" got to do with lower filtration costs?

It's a particle of CELITE that covers more

Assures highest purity in pharmaceuticals

Among the many important uses of Celite diatomite filter aids in industry today is the vital part they play in the production of life-saving antibiotics. Not only does Celite safeguard the purity of aureomycin, streptomycin and other pharmaceuticals; they also provide substantial cost savings that permit wider usage of these *wonder drugs.*

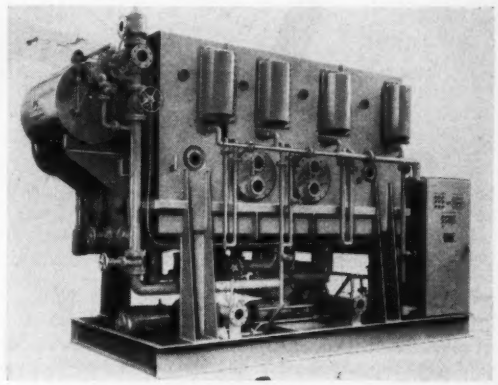
operation in September, 1955 (see CHEMICAL PROCESSING, Dec. 1955, pages 62-63). Third unit, a swimming-pool research reactor, is in an advanced stage of construction and will be in operation later this year. When completed, these units will provide $3.5 million worth of facilities which will be available to both industry and government for research.

(Information courtesy of Battelle Memorial Institute, Dept. CP, 505 King Avenue, Columbus 1, Ohio.)

Waste heat from diesel engines used to make fresh water from sea water

Fresh water from sea water at a cost of only 33c for 1000 gal is possible with new four-stage evaporator. Using waste heat from ship's diesel engines, unit in effect raises diesel efficiency from 30 to 60% by producing an abundant supply of pure water for shipboard use.

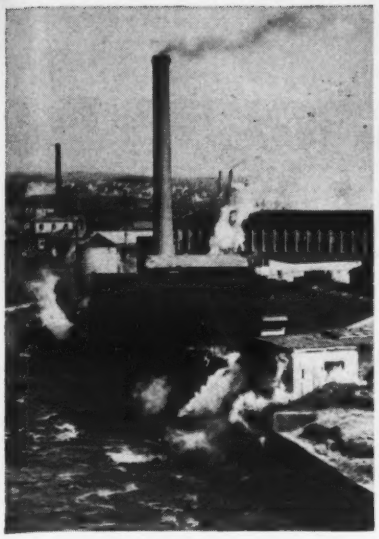
Evaporators are also expected to find wide use on off-shore drilling rigs where fresh water is essential for drilling-mud makeup, drinking, and bathing. Water for such applications is now barged in at cost as high as 25c a bbl. It is estimated that savings resulting from use of the evaporators here can cut operational costs thousands of dollars annually.



Evaporator can produce 1500 gal pure water an hr

The waste-heat evaporator makes use of normally wasted heat dissipated in jacket heat, lube oil, and diesel exhaust. Unit produces fresh water in direct proportion to waste heat available. Operating characteristics curves show that at less than 80,000 Btu a minute, evaporator will produce 1500 gal an hour of pure distillate. Scaling is said to be negligible.

(Waste-heat evaporator was developed by Cleaver-Brooks Company, Dept. CP, 326 E. Keefe Avenue, Milwaukee 12, Wis. . . . or for more information check CP 5257 opposite last page.)



Protects communities from contaminated plant waste

Celite helps control pollution through removal of suspended solids from plant waste waters. Celite treatment often permits plants to reuse this water.

Provides greater clarity in varnish, lacquer and shellac

Celite filtration provides the high degree of clarity required in clear finishes. Celite is also widely used by the paint industry as a flatting agent and pigment extender.

Gives appetizing sparkle to syrups, jellies and other foods

Many food processors make an important *sales plus* of the outstanding brilliance that Celite provides. Celite also helps increase juice yields as a pressing aid.

-the diatomite filter aid

filter surface per pound

THAT'S RIGHT. Celite* is the diatomite that gives you superior clarification at fast flow rates PLUS lower wet density. And lower wet density simply means greater surface coverage per pound of Celite. Which means substantial savings to you, for 6 bags of Celite will actually do the work of 7 bags of other diatomites.

And Celite is uniform. Every pound of it comes from Lompoc, California, the world's largest and purest diatomite deposit. Here, J-M technicians process and grade it so that no matter which convenient J-M warehouse you order from, the physical and chemical properties of each grade will never vary.

In addition, from Celite's full line of filter powders you can select the one grade that will give you the clarity you need at the highest flow rate.

So if filtration belongs in your processing operations, it will pay you to call in your local J-M Celite engineer. Backed by Johns-Manville's research facilities and years of practical diatomite experience, he can help you with your filtration problems. Call him today or write Johns-Manville, Box 60, New York 16, New York. In Canada, write 565 Lakeshore Road East, Port Credit, Ontario.

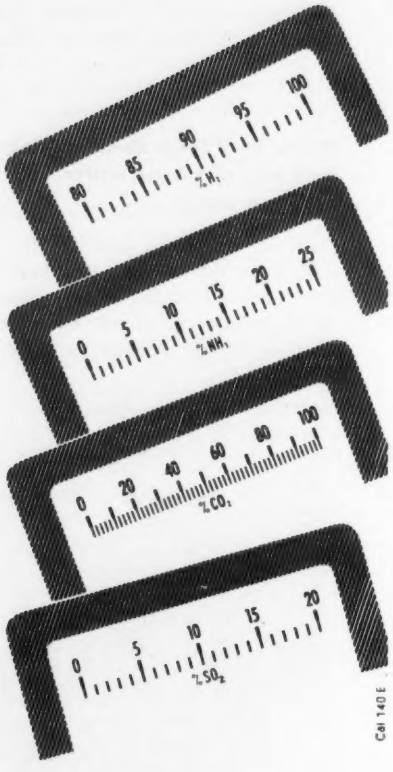
*Celite is Johns-Manville's registered trade mark for its diatomaceous silica products.

JOHNS-MANVILLE PRODUCTS **Johns-Manville** CELITE FILTER AIDS

When inquiring check CP 5256 opposite last page

SIEMENS
MEASURING
INSTRUMENTS

Indicating
Recording
Controlling

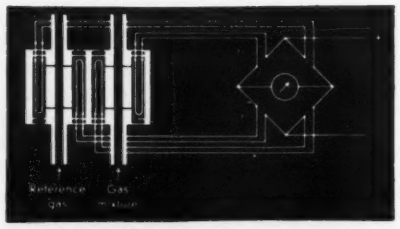


Continuous Analysis

of sulfur dioxide, ammonia, carbon dioxide, medium or high percentages of hydrogen etc. in gas mixtures of chemical processes
... with our new

Differential Gas Analyser

This instrument, developed from our approved Flue-Gas Analyser of the thermal-conductivity method, has been modified to use special reference gases.



Schematic of Differential Gas Analyser

SIEMENS & HALSKE AKTIENGESELLSCHAFT
WERNERWERK FÜR MESSTECHNIK · KARLSRUHE
WEST GERMANY

When inquiring check CP 5258 opposite last page

instrumentation & control

Senses liquid level, actuates control —PNEUMATICALLY

On-off control unit is operated from movement inside a pressure vessel and coupled to the outside through a non-magnetic stationary barrier seal by magnet. Positive control action has capacity high enough to over-ride other controls . . . and high air capacity cuts transmission lag

Uses: Will open or close control circuit up to 100 psi (does not change pressure). Transmitter may be changed in the field for normally-open or normally-closed (maximum or minimum pressure) operation. Pneumatic signal switches from minimum to maximum (or conversely) when liquid or fluidized solid reaches predetermined level.

Features: Tight seal (float motion is coupled out by magnet) and absence of electrical units make level transmitter safe for explosion-hazard areas.

Description: Floats or displacers are used to contact liquid or fluidized solid in tank as in manufacturer's conventional level equipment. In this air-operated relay, however, float rod raises or lowers a magnetic armature inside a sealed tube connected to the tank. When this magnetic armature is raised or lowered into field of magnet out-

Closure pressure can be adjusted with an Allen head wrench

Float

side the
tube. Le
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to squee
Availabl
flow of
flapper.

While e
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applicati
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maintain
to date)
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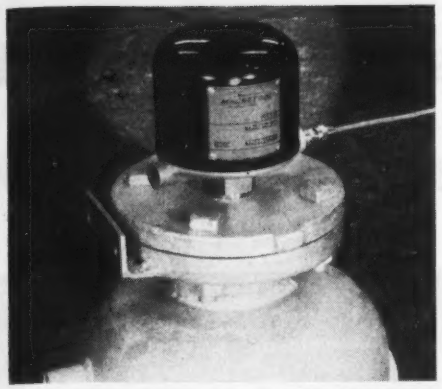
Dispens
tanks ar



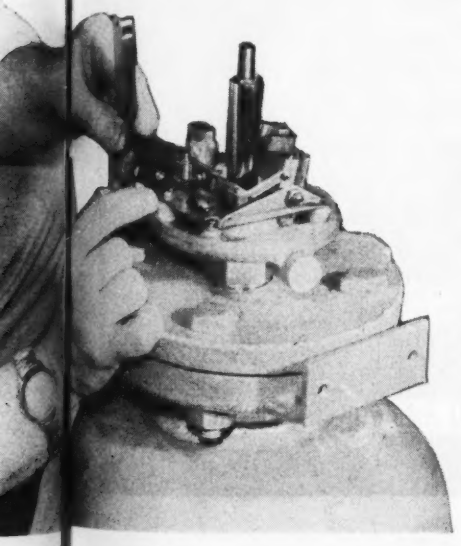
Float motion in pressure vessel is coupled out by magnet through a barrier seal

side the tube, magnet and its lever "snap in" against tube. Lever motion is transmitted through a linkage with a 12 to 1 mechanical advantage. Motion is used to squeeze a flapper valve against a 1/16" air orifice. Available force is sufficient to completely seal off flow of air since a resilient pad is mounted on the flapper.

While extensive field tests have been made, designers of this device feel that they still have a good many applications to learn about. One prime field of application is transmission of liquid level in explosion-hazard areas since tight seals on the tank can be maintained to high-pressure (6000 psi in some tests to date) and no electrical circuitry is required for level sensing.

Dispensing with electrical circuitry also means that tanks and tank farms removed from power sources

(*Please turn to page* 86)



High Sensitivity Micro-Differential

PRESSURE METER

Completely Self-Contained

no accessories required

Measures

A WIDE RANGE OF **STATIC & DYNAMIC**

pressure of gases and other non conducting fluids. Includes provisions for oscilloscope viewing and recording on an optical oscillograph or a direct writing recorder.

Determines

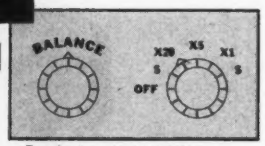
VARIATIONS OF **PRESSURE, VOLUME**

temperature, fluid flow, expansion, absorption, adsorption, chemical alterations, altitude, vacuum, etc.

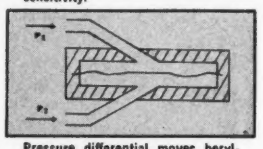
Provides

ONE MICRON OF MERCURY **RESOLUTION**

at any ambient pressure up to 2 atmospheres. 7.5 volts output available for recording at full scale differential pressure of 1 mm of mercury.

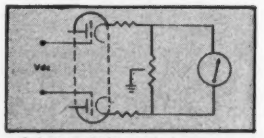


Two-knob control for balance, . . . sensitivity.

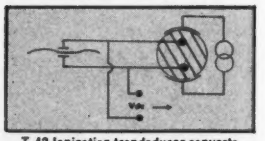


Pressure differential moves beryllium-copper diaphragm.

Utilizes the T-42 IONIZATION TRANSDUCER



Output applied to cathode follower to drive meter.



T-42 ionization trandsducer converts motion into electrical signal.

This unusually simple pressure instrument is completely self contained. It requires no special accessories, additional equipment or trained personnel for operation. Merely plug this compact instrument (only 5" x 5" x 10") into the 115 V, 60 cy. line and in 2 minutes it is ready for use. Two knob control . . . for balance and sensitivity.

It is an extremely versatile and truly valuable accessory for any laboratory.

Details on this new micro-sensitive meter are in Instrument Data Sheet 303-1, available upon request to Technical Literature Section.

decker AVIATION CORPORATION

1361 Frankford Ave., Philadelphia 25, Pa., PHONE GArfield 5-2300

When inquiring check CP 5259 opposite last page

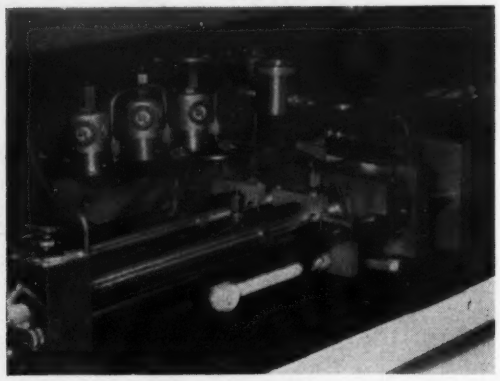
Does not respond to radiation outside desired wavelengths of infrared . . .

uses selective detectors and operates by measuring loss of energy through sample

Uses: As automatic analyzer of process streams. Typical applications are determination of CO and CO_2 in concentrations of 0-50 ppm, analysis of isobutane in mixtures of pentane and n-butane.

Features: Infrared analyzer is dual beam, nondispersive instrument employing selective detectors. Instrument operates by measuring loss of energy of infrared beam passing through sample.

Description: Analyzer has two separate condenser microphone detectors filled with gas to absorb radiation only in wavelength useful in desired analysis. Detectors may be independently



Two condenser microphone detectors can be independently sensitized

sensitized. Unwanted radiation can be ignored and a high signal-to-noise ratio is possible. Since analyzer is a positive filtering model, selective detectors do not respond to radiation outside desired wavelength regions. Detectors have a high inherent discrimination against other sample components that absorb outside these regions.

(Cary Model 70 Infrared Analyzer is a product of Applied Physics Corp., Dept. CP, 362 W. Colorado St., Pasadena, Calif. . . . or for more information check CP 5260 on form opposite last page.)

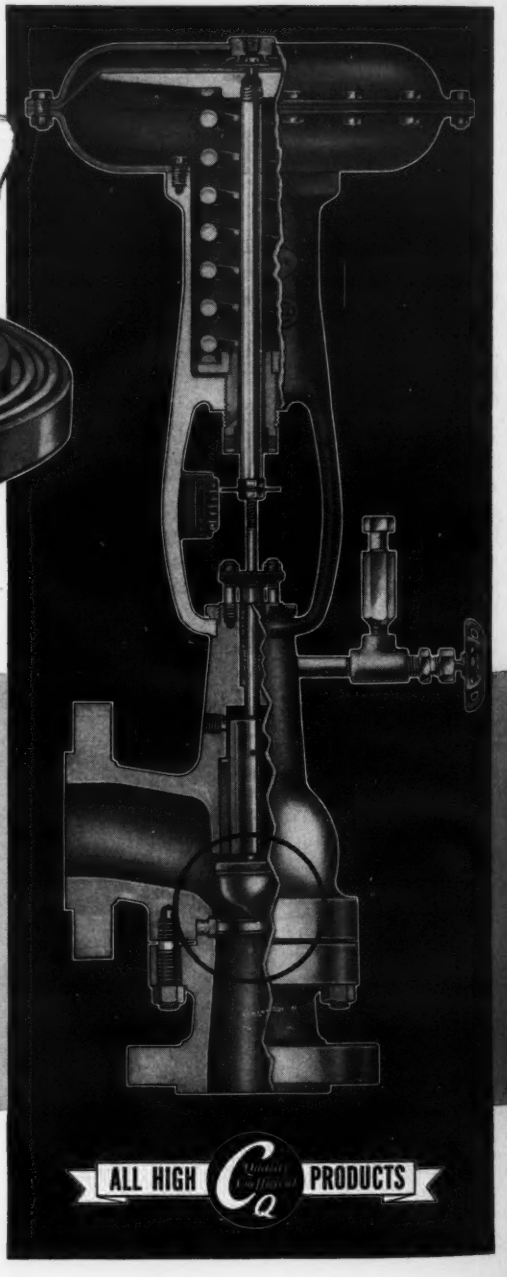
How to do it with porcelain

Sizes and construction of insulated porcelain electric terminals are shown in two-color engineering bulletin.

Bul 1055 is issued by Frenchtown Porcelain Company, Dept. CP, 155 Muirhead Ave., Trenton 9, N. J. When inquiring specify CP 5261 on form opposite last page.

Masoneilan

"These Exclusive Better Service,



SPECIFICATIONS:

777 SERIES CONTROL VALVE

Material:	Cast steel or cast iron
Size:	1" to 6"
Connections:	Flanged
Rating:	Cast steel — ASA 150, 300, 400, 600 lb. Cast iron — ASA class 125, 250

Available with direct motor (No. 777-19) or reverse motor (No. 778-19) and with finned bonnet construction.

PLUS values . . .

Design Features Insure Greater Flexibility"

Here are the three big reasons you get more for your money with Masoneilan angle valves . . .

REVERSIBLE SEAT RING has ground and lapped gasketless joint assuring accurate centering, vertical alignment and tightness. Provides new seating surface quickly when needed, shortens downtime.

REDUCED CAPACITY plugs and seat rings available in .4 Factor standard reduction. Also in .7 Factor for added flexibility in 6″ valves used in high pressure-drop service; and in .4^2 Factor (capacity ratio .16); and in .4^3 Factor (capacity ratio .06) for use on small flow applications.

PLUG GUIDING IS HEAVY DUTY, large diameter guide section with minimum length of two guide diameters operating in hardened stainless steel bushing.

Masoneilan 777 series Control Valves are well suited for slurry service, in heater drainer service where flashing may occur, and on soot blower applications. Their streamlined, non-clogging inner contours cut down erosion and reduce turbulence.

It will pay you to get the story on *all* Masoneilan Control Valve *plus* features. They add up to extra value and true cost reduction. Call your nearest Mason-Neilan representative or write:

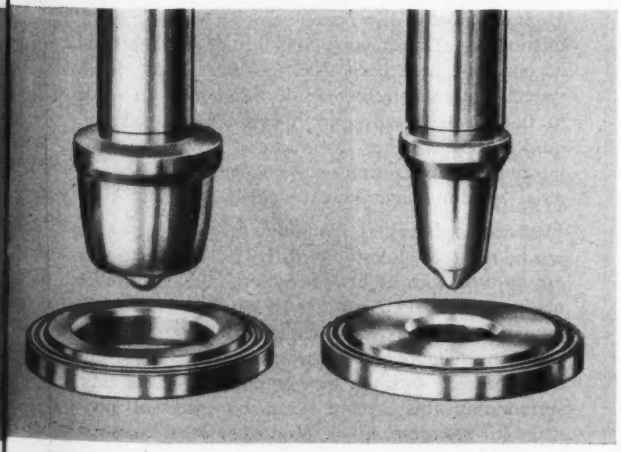
MASON-NEILAN

MASONEILAN

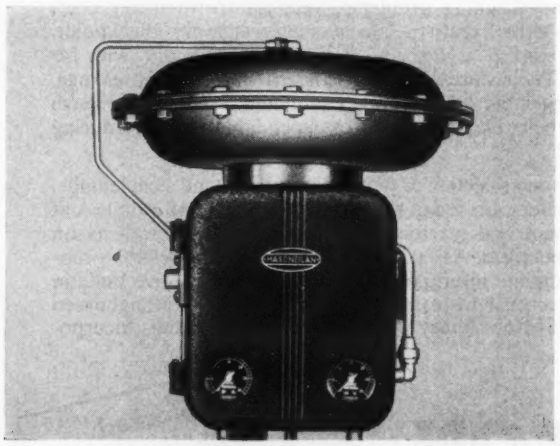
Division of Worthington Corporation

25 NAHATAN STREET, NORWOOD, MASS.

Sales Offices or Distributors in the Following Cities: New York • Syracuse • Chicago • St. Louis • Tulsa • Philadelphia Houston • Pittsburgh • Atlanta • Cleveland • Cincinnati • Detroit • San Francisco • Boise • Louisville • Salt Lake City El Paso • Albuquerque • Odessa • Charlotte • Los Angeles • Corpus Christi • Denver • Appleton • Birmingham New Orleans • Dallas • Seattle • Mason-Neilan Regulator Co., Ltd., Montreal and Toronto



Full capacity and .4 Factor plugs and seat rings are interchangeable in standard body, as are other reduced capacity plugs and seat rings. They are all precisely sized for accurate fit and alignment.



New 2800 series (Model 2807 shown) Pressure Controllers offer (1) fast response, (2) high sensitivity, (3) low cost and (4) proportional band of 1 to 30%.

When inquiring check CP 5262 opposite last page

Will hold pneumatic pressure to within 1/10 of 1% all day long . . .

regulator uses measuring element with low coefficient of thermal expansion

Uses: As regulators for remote setting of controllers, pneumatic gaging applications, vibratory pneumatic installations.

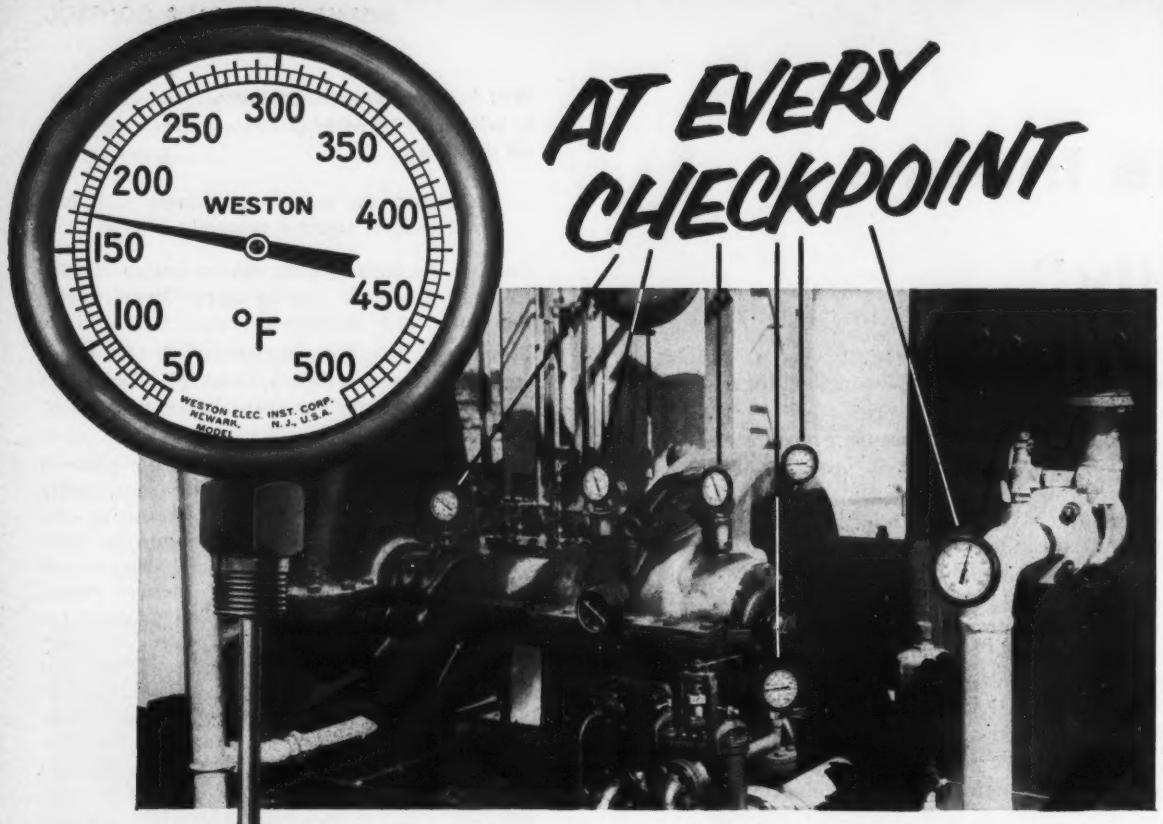
Features: Pneumatic regulators will hold pneumatic pressure to within 1/10 of 1%. Change in control point due to periodic shut-down is negligible.

Description: Accuracy of pneumatic pressure controller is due to elasticity of Ni-Span C measuring element. This capsule is "hysteresis-free" and has a low coefficient of thermal expansion. Small relative motion between pilot valve and seat (usually less than 0.0001″) is required to make substantial changes in main valve position. Regulators are available in 25 and 60 psi standard ranges for 1/8 and 1/4-inch pipe sizes. Units have a single 1/4″ NPT tap for a gage. Flow capacity is approximately 6 cfm.

(Series 5000 Regulators are products of Governaire Div., Bellofram Corp., Dept. CP, Burlington, Mass. . . . or for more information check CP 5263 on form opposite last page.)

"H-m-m. . . and exactly how long have you had the position of Instrumentation Engineer?"

This cartoon was sent to us by S. L. Peeno, Designing Draftsman, Drug Engineering Section, Procter & Gamble Co., Cincinnati, Ohio.

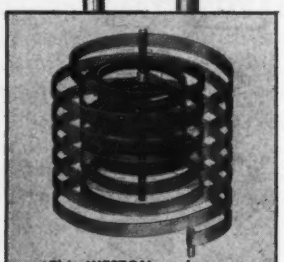


WESTON *all-metal* THERMOMETERS

(with Multiple Helix*)

Here's another typical example of how large processing plants have solved temperature checking problems, and cut thermometer costs besides. With a WESTON dial-type thermometer at every checkpoint, temperatures are read at a glance . . . in far less time, and with far greater accuracy. Their sturdy all-metal construction resists breakage, gives them far longer life on operating equipment. And the exclusive WESTON multiple helix employed assures dependable accuracy during all this long life.

Available in a broad selection of types, sizes, ranges and stem lengths, WESTON thermometers are today standard on all types of mobile and stationary equipment and machines, large and small; as well as on piping, conduit, ducts, etc. Ask your distributor, or local WESTON representative for complete information, or write for descriptive bulletin . . . WESTON Electrical Instrument Corporation, 614 Frelinghuysen Avenue, Newark 5, New Jersey. A subsidiary of Daystrom, Incorporated.



*This WESTON-made sensing element is the more costly, non-sagging, multiple-helix. Carefully aged over a broad temperature range for long periods, it assures better accuracy, over a longer life.

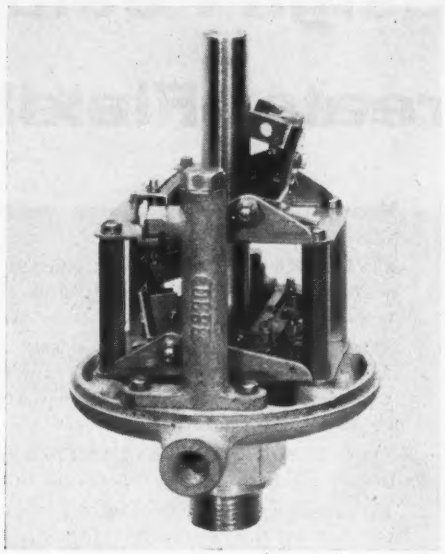
WESTON 5537 *Thermometers*

Stocked by leading Distributors

When inquiring check CP 5264 opposite last page

Pneumatic Level Controller

(*Continued from page* 83)



Tandem controls can give alarm and automatic shutdown if level rises higher

can be monitored with power furnished by local air compressors or natural gas directly from a well. Air consumption for this device is high with a 1/16″ orifice. This combination, however, provides such high air capacity that level transmitter can be installed *in existing pneumatic control lines. In event high level is reached, transmitter will act as an overriding alarm and force line pressure up or down depending on setting.*

High air capacity also is important in reducing transmission lag. Transmission lines in the neighborhood of one mile have been used in "emergency" alarm systems with satisfactory results since high air input to this device means that line can be "filled up" quickly. Still another advantage of air operation is purging of the transmitter where dusts or other material buildup might impair operation.

Floats or displacers, as opposed to magnetic armature, can be made of almost any material. Thus, controller can be used with highly corrosive liquids. Controller mechanism has been made in all stainless and Hastelloy construction. No restriction on materials of construction is imposed because magnetic armature can be "sheathed" with any type of material. Sealed tube surrounding this armature can be made of nonmagnetic stainless, silver, Monel, or other material to provide good corrosion resistance.

Unit can be designed with small orifice to reduce air rate where over-riding feature and fast transmission are not advantageous. Supply pressure of 15 psig is sufficient for either 1/16″ or smaller orifice — though 80-100 psi is recommended where long transmission lines are used.

Two units can be mounted in one housing and driven from same float rod. Both pneumatic devices are then driven by same or separate magnetic armatures. Obvious use for tandem arrangements would be alarm when high (low) level is reached, with automatic shutdown if level rises still higher (or falls still lower).

Pneumatic level controllers are interchangeable with manufacturer's conventional electric level controllers. Tandem units can be built with one pneumatic and one electric transmitter.

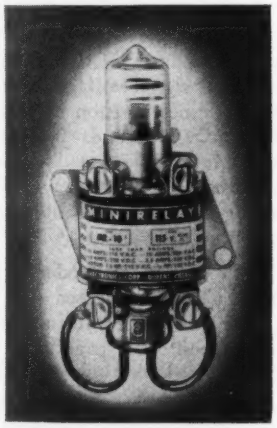
(Pneumatic level controller is a development of Magnetrol, Inc., Dept. CP, 2110 S. Marshall Blvd., Chicago 23, Ill. . . . or for more information check CP 5265 on form opposite last page.)

Miniature mercury relay is totally enclosed for safety . . .

has make or break action of about 30 milliseconds and has load capacity of 20 amp

Uses: For safe, silent operation in explosive, dusty, dirty, or moist atmospheres where open mechanical relays cannot be used for alarm and control systems.

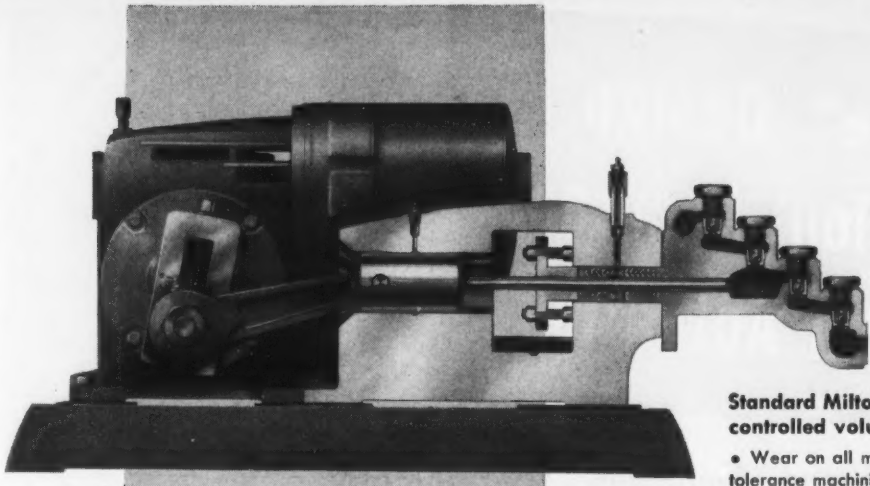
Features: Mercury plunger relay is miniature and has a capacity of 20 amps at 115 volts, 50/60 cycles. Mercury-to-mercury contacts are totally-enclosed in hermetically-sealed heavy industrial glass. Relay has no exposed arc and there are no points to pit, stick, or deteriorate. Relay operates through movement of magnetic iron core floating on liquid mercury. Magnetic field produced by current through coil causes movement of iron core, causing mercury contacts.



Relay contacts are totally enclosed

Description: Relay is 3½ x 1¾ x 1½". Ratings are 20 amps at 115 volts, 50/60 cps AC, or 6.5 amps at 120 volts, DC. Coil voltage is 115 volts AC. Pull-in voltage is 81; pull-out voltage is 61. Relay can be either NO or NC, SPST.

(Minirelays are products of Ebert Electronics Corp., Dept. CP, 212-26 Jamaica Ave., Queens Village 28, N.Y. Check CP 5266 opp. last page.)

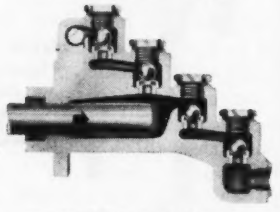


Standard Milton Roy motor-driven controlled volume pump.

• Wear on all moving parts minimized by close tolerance machining of cross-head, pump frames and liquid end parts. • Excessive packing wear avoided by large length-to-diameter ratio of cross-head which fully supports plunger. • Long service life under shock and oscillating loads assured by generously-sized reducer and connecting rod bearings.

Dependability for metering process additives

Exclusive Milton Roy STEP-VALVE LIQUID END



Double ball checks, sloping passages and absence of air pockets assure highest possible volumetric efficiency. Should a solid particle lodge under one suction ball, for example, second suction ball will seat on discharge stroke, thereby preventing fluid from being pumped into suction piping.

MILTON ROY dependability means long service life in your controlled volume pump . . . minimum maintenance . . . lower operating cost.

Here's why. Designed-in dependability is the result of extreme care in the sizing of motor horsepower, reducer torque and overhung load capacity. Reducer, motor and pump mounting pads on a rigid, webbed base are precision machined to assure perfect alignment of the entire assembly . . . and of all moving parts.

Specify Milton Roy . . . your guarantee of dependability in controlled volume pumps and complete chemical feed systems. A practical solution to your metering problem will be found in one of the following bulletins. Write for your copy today.

Bulletin 455 "Controlled Volume Pumps in Paper Making."

Bulletin 953 "Controlled Volume Pumps in Industrial Water Treating."

Bulletin 1253 "Controlled Volume Pumps in Process Instrumentation."

Milton Roy Company, *Manufacturing Engineers*, 1300 East Mermaid Lane, Philadelphia 18, Pa.

Engineering Representatives in the United States, Canada, Mexico, Europe, Asia, South America and Africa.

milton Roy
CHEMICAL FEED SYSTEMS

When inquiring check CP 5267 opposite last page

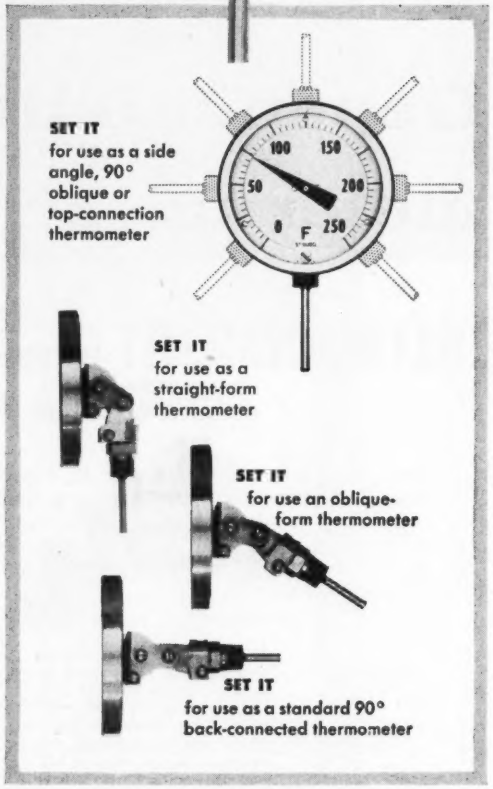
"Every Angle" Design Maxivision® Accuracy Bi-Metal Actuation

Now... all 3 in one 'American' Thermometer

Only this new American Thermometer* gives you the three features most demanded in a dial thermometer. The "Every Angle" design allows you to install this thermometer *anywhere* . . . then angle it in the direction that provides easiest reading. The anti-parallax Maxivision dial guarantees the surest, sharpest, easiest reading. Graduations are carried on a raised ring, set close to the cover glass, with an index-type, functional pointer set at the same level. The result – no perspective effect – parallax error practically eliminated. Finally, bi-metal actuation insures high sensitivity, economy, and surety of operation.

Install the new American "Every Angle" Bi-Metal Dial Thermometer anywhere – inside or out. Its climate-proof case defies any weather condition. The full use of these thermometers in any process plant makes possible temperature readings with the same ease and facility of those of a pressure gauge. Write today for complete information. Ask for Bulletin 148.

*Pat. App. For



SPECIFICATIONS

5-Inch Type 5-6060 American "Every Angle" Bi-Metal Dial Thermometer

Temperature Ranges: From minus 80° to plus 1000° F. Accuracy within 1% of range. *Dial Size:* 5". Scale approximately 10½" long. *Bi-Metal Coil:* Low mass, with single helix close to inside wall of stem assures high sensitivity. Silicone fluid dampens vibration, accelerates transfer, speeds response. *Case:* Stainless steel. *Bezel:* Threaded to case. *Front:* Clear, extra-heavy glass set in channeled gasket to seal case. *Pointer:* Functional type, adjustable from front. *Stem:* Lengths – 4" to 24", 18-8 stainless steel. All joints welded. *Connection:* Fixed, ½" NPT. *Separable Sockets:* Available in all materials and sizes normally required.

PHONE your Industrial Supply Distributor for experienced attention to your needs. He is always ready to help you ward off costly shut-downs through fast delivery from local stocks.

AMERICAN INDUSTRIAL INSTRUMENTS

A product of **MANNING, MAXWELL & MOORE, INC.** STRATFORD, CONNECTICUT

MAKERS OF 'AMERICAN' INDUSTRIAL INSTRUMENTS, 'CONSOLIDATED' SAFETY AND RELIEF VALVES, 'AMERICAN-MICROSEN' INDUSTRIAL ELECTRONIC INSTRUMENTS, *Stratford, Conn.* 'HANCOCK' VALVES, *Watertown, Mass.* 'CONSOLIDATED' SAFETY RELIEF VALVES, *Tulsa, Oklahoma.* AIRCRAFT CONTROL PRODUCTS, *Danbury & Stratford, Conn. and Inglewood, Calif.* "SHAW-BOX" AND 'LOAD LIFTER' CRANES, 'BUDGIT' AND 'LOAD LIFTER' HOISTS AND OTHER LIFTING SPECIALTIES, *Muskegon, Mich.*

When inquiring check CP 5268 opposite last page

Miniature servo system used to graphically record mv signals . . .

tube characteristics do not affect stability or accuracy of trace

Uses: As recording DC millivolt meter for — with appropriate transducers — pressure, light intensity, temperature, other physical quantities.

Features: Graphic recorder is portable and gives a rectilinear trace representation.

Description: Recorder operates on principle of self-balancing potentiometer. Unit is actually a miniature servo system, in which a servo motor

Portable recorder has full-scale response time of 2.5 seconds

rotates a potentiometer to produce a DC bucking voltage to cancel applied DC signal voltage. Rotation of potentiometer determines position of writing pen. Response time is 2.5 seconds for full scale. Span is 100 mv. Accuracy is 1%. Chart speeds can be 2 or 4 inches per minute, or 4, 16, or 40 inches per hour. Line requirements are 105-125v AC at 60 cps. Weight is about 15 lb.

(Model G-10 Graphic Recorder is product of Varian Associates, Dept. CP, 611 Hansen Way, Palo Alto, Calif. . . . or for more information check CP 5269 on form opposite last page.)

Develops theory for flow which reverses in tubes

Illustrated eight-page booklet develops mathematical theory for alternating flow of fluids in tubes.

Instrument Notes No. 30 is issued by Statham Laboratories, Inc., Dept. CP, 12401 W. Olympic Blvd., Los Angeles 64, Calif. When inquiring specify CP 5270 on form opposite last page.

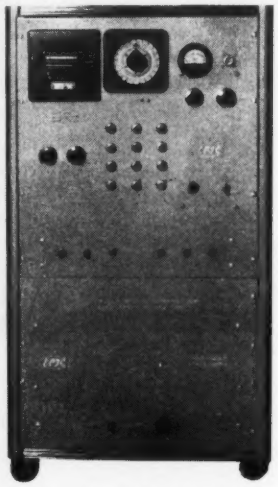
Fast scintillation counter handles scale input to ten mc . . .

can be based on either decade or binary system with resolution of 0.1 microseconds

Uses: As high speed scintillation counter in nuclear and general purpose applications.

Features: High-speed counter will handle an input to 10 mc with resolution of 0.1 microseconds.

Description: High-speed scalers can be based on either decade or binary system by using pulse flow through four-stage binary scaler. Diode gates, controlled by normal binary progression of counts through scaler, direct pulse flow. Scaler has five digit electrical reset register with predetermined count from one to 99,999. Scaler includes predetermined timer, an elapsed time clock, a regulated 500-2500 volt power supply. Standard units have maximum scale factors of 1000 for decades or 4096 for binaries. Scale selector switch selects scale factor of 10, 100, 400, or 1000 on decade models; 128, 512, 2048, or 4096 on binary models.



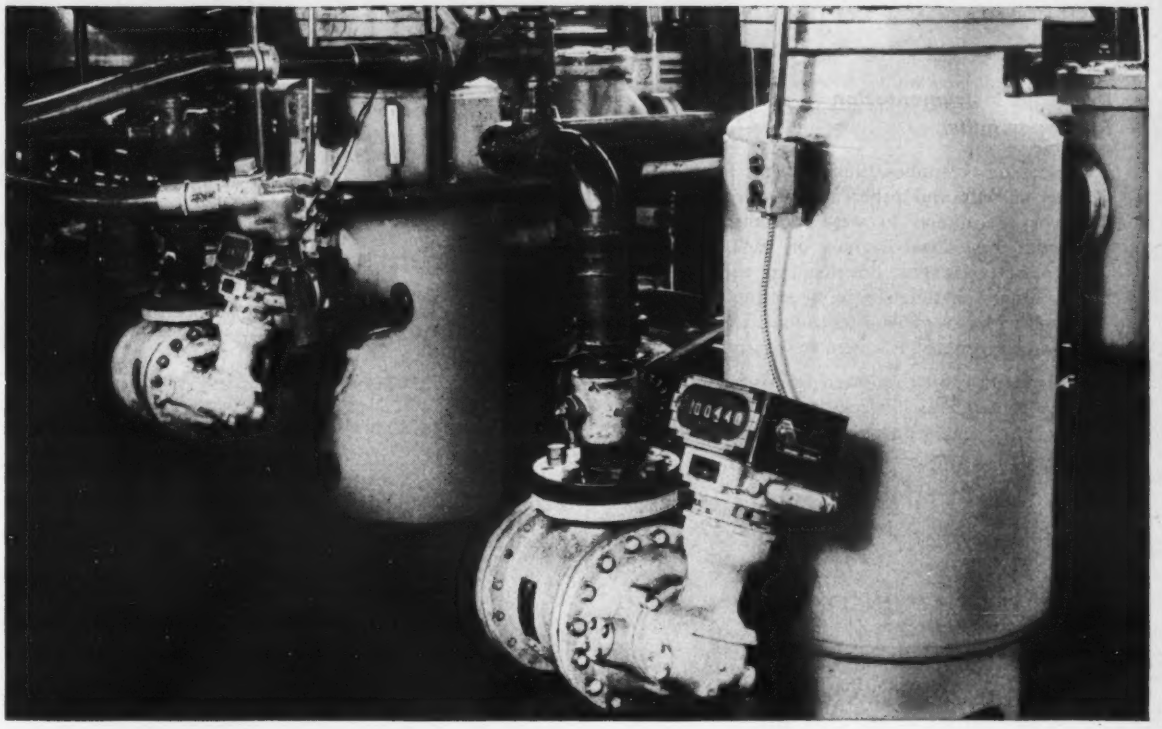
Has gate system for reliability of counting

(4000 Series 10 mc scalers are product of Electrical and Physical Instrument Corp., Dept. CP, 42-19 27th St., Long Island City 1, N. Y. . . . or for more information check CP 5271 on form which is located opposite last page.)

Explains electrolytic control and measurement

Explaining theory of electrolytic conductivity measurement, 16-page booklet describes equipment necessary for measurement and control of electrolytic solutions. Suggested applications include controlling demineralized water, electrolytic impurities in distilled water, concentration of acid pickling baths, total solids content of raw water.

Cat No. 22 is issued by Industrial Instruments, Inc., Dept. CP, 89 Commerce Road, Cedar Grove, Essex County, N. J. When inquiring specify CP 5272 on form opposite last page.



Improve Your End Product, Cut Liquid Processing Costs

With Rockwell Industrial Meters you will eliminate the human error in handling liquids and compounding formulas. By supplanting time consuming weight or gauge methods, you'll save money. With a closed metered piping system you can avoid hazards and contamination. And remember, since Rockwell meters are available in a wide variety of metals (including stainless steel) you can measure most any liquid that can be piped. Let our engineers advise on your services. Write or use the handy coupon.

ROCKWELL INDUSTRIAL METERS

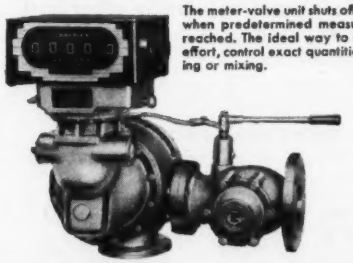
Give Accurate Measurements—Fast!

Durable, All-Metal Construction In

STAINLESS STEEL BRONZE ALL-FERROUS STEEL

Automatic Quantity Control

The meter-valve unit shuts off automatically when predetermined measured volume is reached. The ideal way to save time and effort, control exact quantities when batching or mixing.



Provides Pre-Set Meter Shut-off Without Shock!

CLIP COUPON—MAIL TODAY

ROCKWELL MANUFACTURING COMPANY 106E
Pittsburgh 8, Pennsylvania

Gentlemen:

I am interested in measuring _____ (Name of Liquid)

Pipe Size _____"

Working Pressure _____psi Temperature _____°F max.

Max. Flow Rate _____gpm Min. Flow Rate _____gpm

Your Name _____

Company _____

Street _____

City _____ Zone ____ State _____

When inquiring check CP 5273 opposite last page

Describes instrumentation for paper mills

Describing instrumentation systems for 24 sections of pulp and paper mills — from cooking liquor preparation to wet-end control, 32-page booklet has flow diagram of each operation. Among the systems described in the two-color booklet are an automatic semi-continuous calcium bleach system, a method for automatic preparation of soda bleach, and a system for controlling slime.

Bulletin 90-130-10 is issued by Fischer & Porter Co., Dept. CP, 626 Jacksonville Rd., Hatboro, Pa. When inquiring specify CP 5274 on form opposite last page.

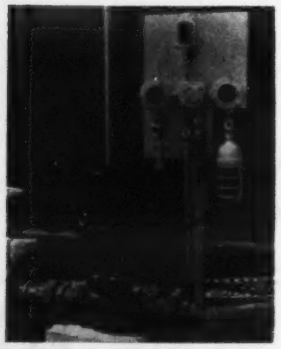
Can be complete control system or automatic indicator of liquid level . . .

electronic unit measures fluid levels or interface of two liquids — and then acts

Uses: As completely automatic liquid-level control system or as automatic indication system, with alarm, in handling both corrosive and non-corrosive liquids.

Features: Accuracy of liquid-level controls and indicators is not affected by specific gravity, viscosity, conductivity, or pressure.

Description: Instrument uses electronic system with one tube. Low-power radio-frequency energy is fed to sensing electrode. Changes are detected in electrode's RF field due to "loading" by liquids. Unit will energize alarms, lights, solenoid valves, motor starters. Instrument will operate as completely automatic control system when coupled with a valve and timer. When instrument is operated with alarm, it will serve as an automatic indication system. Instrument consists basically of three parts: an electrode which accurately measures either fluid level or interface of two liquids within a vessel; an indicating light or audible alarm unit for warning; and a timing device. Instrument operates in conjunction with any liquid with a dielectric constant greater than three and on any two liquids with a difference greater than 15. (Water has a dielectric constant of

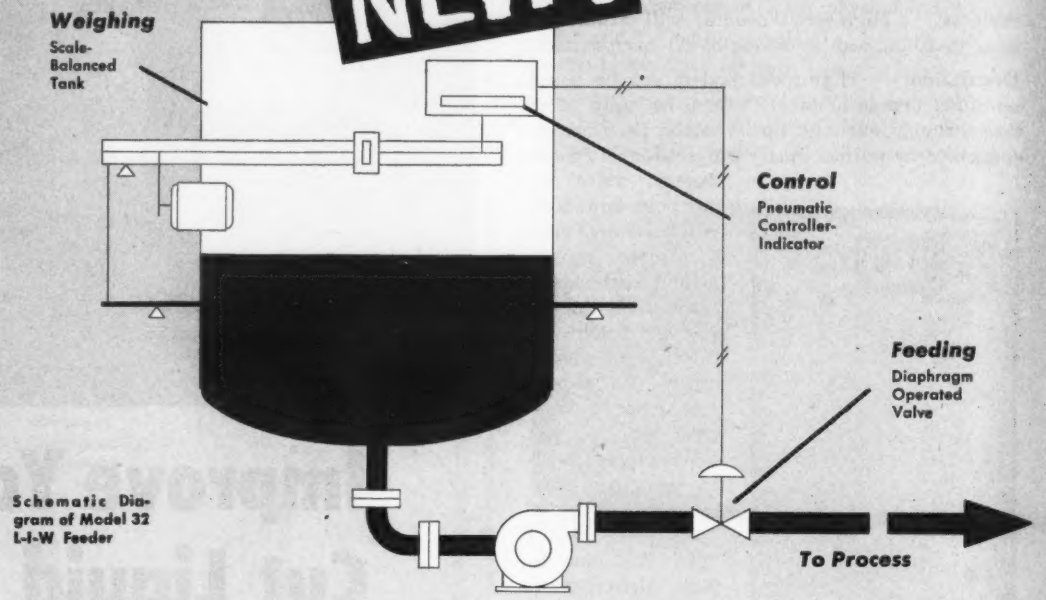


Tank bleeder installation

NEED ACCURACY?

NEW!

FEED



Schematic Diagram of Model 32 L-I-W Feeder

How the OMEGA L-I-W Feeder Operates

The weigh tank is mounted on scale lever system balanced by travelling counterpoise on a calibrated scale beam. A constant speed motor drives a lead screw, retracting the counterpoise at a predetermined rate of feed.

Over- or under-feed results in deflection of the scale beam from a set point. Any imbalance is sensed by a pneumatic controller which develops and transmits a pneumatic signal (3-15 psi) to a diaphragm motor operated throttling valve, or other feeding mechanism. Feeder can be "tuned" to process conditions through reset and sensitivity adjustments.

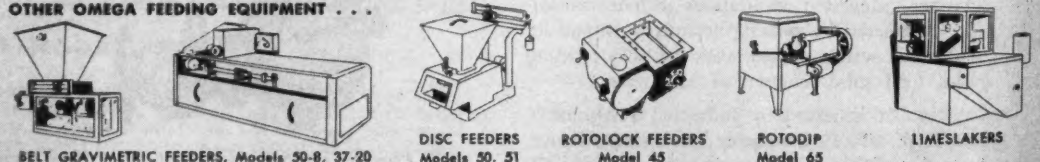
BASIC MODELS

SOLIDS
Simplex Model 30A
Duplex Model 31*

LIQUIDS
Simplex Model 32
Duplex Model 33*

*Duplex is basically two Simplex units with reversing mechanism.

OTHER OMEGA FEEDING EQUIPMENT . . .



BELT GRAVIMETRIC FEEDERS, Models 50-8, 37-20

DISC FEEDERS Models 50, 51

ROTOLOCK FEEDERS Model 45

ROTODIP Model 65

LIMESLAKERS

D BY WEIGHT!

Use OMEGA'S Continuous Loss-in-Weight Feeders for plant efficiency . . . and profits!

LIQUIDS

- CLEAR SOLUTIONS
- SUSPENSIONS
- VISCOUS
- TOXIC
- CORROSIVE
- EXPLOSIVE

SOLIDS

- PULVERIZED
- GRANULAR
- HYGROSCOPIC
- LUMPY
- COHESIVE
- TOXIC

Omega Machine Co. *Continuous* Loss-in-Weight Feeders are complete control loops . . . incorporating the sensing, comparing and correcting elements found in the most advanced instruments. They FEED BY WEIGHT . . . the ultimate standard of accuracy in materials measurement and control . . . no need to take samples or check weights.

ACCURACY: Within ±½% of set feed rate, independent of changes in bulk density, specific gravity, or viscosity.

CAPACITY: Maximum feed rates up to —
60,000 lbs/hr for liquids
40,000 lbs/hr for solids

FEEDING MECHANISMS: Many types . . . control valve, gear pump, conveyor belt, screw feeder, rotor, etc., for greater freedom to handle all materials.

COMPLETE LINE: 4 basic models, each in 3 sizes . . . *90* arrangements, for every process requirement.

SERVICE: Nationwide service organization available.

Model 32 L-I-W Feeder

ASK FOR BULLETINS . . . or, for recommendations by our specialists, send us data on your feeding problem. No obligation, of course. Write today to OMEGA MACHINE COMPANY, 387 Harris Ave., Providence, R. I. . . . division of

B-I-F INDUSTRIES
PROVIDENCE, RHODE ISLAND
BIF METERS FEEDERS CONTROLS

OMEGA MACHINE CO. • PROPORTIONEERS, INC. • BUILDERS-PROVIDENCE, INC.

OMEGA MACHINE CO.
387 HARRIS AVE., PROVIDENCE 1, R. I.

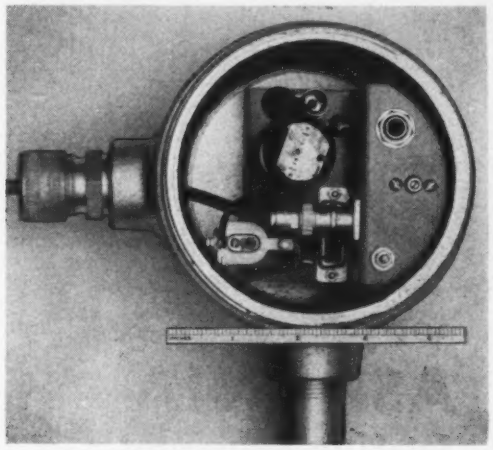
Our feeding problem involves.....

☐ Send Bulletin 31-M3 (Liquids)
☐ Send Bulletin 30A-M3 (Solids)

Name.....
Company.....
Address.....
.....

When inquiring check CP 5275 opposite last page

80, methanol, 56, most common liquids have lower constants.) For fluid level indication, a difference of only three is required. Sensitivity of instrument can be adjusted to give indication and control even though emulsification exists.



Unit furnishes RF energy to sensing electrode

After being set at particular level electrode reacts to changes in level of fluid or fluids. If simple warning is required, relay will actuate a light or bell. In a complete and automatic tank bleeding system, a relay is controlled by timer and activates valve solenoid and motor pump starters. Auxiliary electrode located in line beyond valve shuts down instrument should a component fail. System uses 115v AC. All units meet explosion-proof specifications.

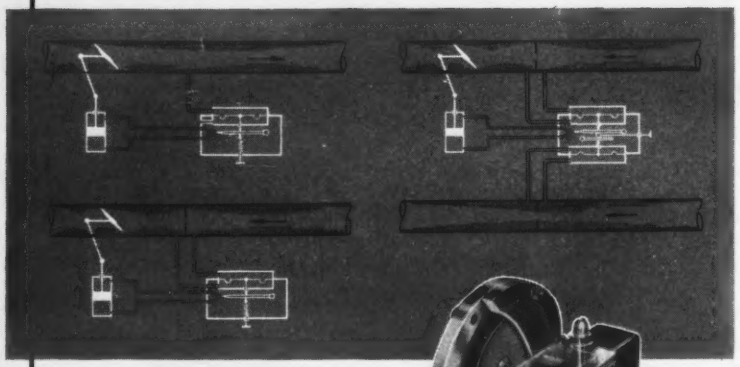
(Enniscope is product of Enniscope, Dept. CP, 2230 Lemon Ave., Long Beach, Calif. . . . or for more information check CP 5276 on form opp. last page.)

More than 70,000 calculations for flow engineering

To speed computation of orifice sizes, coefficients, and flows, this 111-page book of tables contains a total of 77,811 separate flow calculations evaluated to six figures. It presents figures in d/D steps of 0.001 from 0.100 to 0.800 for each of 37 line sizes from 1.535" ID to 29.25" ID. The tables in this book were photographically reproduced from calculations made by automatic computing machines — thus eliminating possibility of typographical errors. Spot checks of calculations were made to rule out possibilities of errors in the operation of the computer.

"Principles and Practices of Flow Meter Engineering" can be obtained by remitting $10.00 direct to The Foxboro Co., Dept. CP, 86 Neponset Ave., Foxboro, Mass. When inquiring specify CP 5277 on form opposite last page.

THE "Jet-Pipe" AGE IS HERE...
FOR PRESSURE, FLOW, COMBUSTION OR RATIO CONTROL



and so is the

ASKANIA
Jet-Pipe Regulator

...the simplest accurate long-life solution to any regulator problem

• Check your most desirable specifications for the IDEAL regulator to control pressure—flow—combustion—proportion—other variables.

Do they include

1 Rugged Construction **2** Dependability **3** Long Life **4** Accuracy **5** Speed **6** Inexpensive Maintenance **7** Unimpeded Operation in Freezing Weather **8** Freedom for use ANYWHERE?

All these features are common to all ASKANIA Jet-Pipe Regulators.

From Minute Signal to POWERFUL FORCE

The real magic behind the Jet-Pipe Regulator is the power which can be initiated by a minute signal—the degree to which the signal can be amplified—and the speed and accuracy with which it can be transmitted. The conversion of kinetic energy (velocity pressure) into potential energy (static pressure) is an important factor which multiplies the dependability you can expect in every ASKANIA control. The heart of ASKANIA Regulators—the Jet-Pipe—is practically frictionless. Bearings are continuously immersed in oil. Condensation and freezing are impossible. In every way, ASKANIA Regulators are designed and built for continuous, trouble free service over the years.

Applicable to these Controlled Variables:

PRESSURE (Gage, Absolute & Differential) • DRAFT • COMBUSTION • FLOW LEVEL • DEPTH • RATIO • SPEED • DENSITY • CONSISTENCY • EDGE POSITION AND OTHERS

What is your problem? For further information on the type of regulator control which best fits your operation, send today for Bulletin No. 139 and 155. Write the ASKANIA REGULATOR COMPANY, *242 East Ontario St., Chicago, Illinois.*

ASKANIA REGULATOR COMPANY

"CONTROLS FOR INDUSTRY"

HYDRAULIC, ELECTRONIC CONTROLS & SERVOS, GENERAL SYSTEMS, ENGINEERING & COMPUTER SERVICE, VALVE ACTUATORS & CYLINDERS

A Subsidiary of General Precision Equipment Corporation

When inquiring check CP 5278 opposite last page

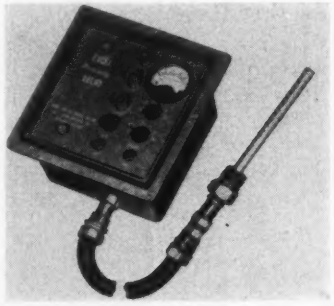
Capacitance probe controls level by relay . . .

can also be used to detect interfaces of materials

Uses: As level control for liquids, granular materials, or solid objects. Can also be used as interface detector.

Features: Controller can be adjusted from ± fraction of an inch to a pump up or pump down requirement of several feet.

Description: Capacitance probe actuates an electronic circuit controlling power relay. Proximity of a movable material to stationary probe actuates circuit. Relay will control solenoid valve, heavy-duty relays, motor starters, signal devices. Probes can be horizontal, vertical, immersion or proximity. Materials can be liquefied gases, liquids, powders, viscous fluids, and granular solids.



Power relay in sealed case is actuated by probe

Operating components are contained in a sealed plug-in housing.

(Proximity relay is product of Excel Electric Service Co., Dept. CP, 2113 S. Western Ave., Chicago 8, Ill. Check CP 5279 opposite last page.)

Instruments needed?

Check the convenient product directory which starts on page 234 in this issue

ARROW
AIR LINE LUBRICATOR

LOOKING INTO THE HEART OF THE PRODUCT

AUTOMATIC OIL MIST LUBRICATION

The Venturi and Porous Bronze Feeder scientifically designed insures complete atomization of lubricant—delivered in correct amount—exactly where required.

"PATENTED"
ARROW LUBRICATOR FEEDER ASSEMBLY
- TAMPER-PROOF ADJUSTMENT
- VISIBLE FEEDER ADJUSTMENT
- AUTOMATIC OIL MIST LUBRICATION ONLY WHEN EQUIPMENT IS IN OPERATION

ARROW
AUTOPNEUMATIC CONTROLS

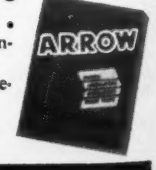
Improve pneumatic machine and tool operation and efficiency. Reduce maintenance and repair costs. Prevent work stoppages.

ALL THE FACTS ARE YOURS..

ARROW engineers and field consultants at your service.

Catalog and engineering data on request.

Your Inquiries Invited.



ARROW TOOLS, INC.

1904 S. KOSTNER AVE. • CHICAGO 23, ILL.

When inquiring check CP 5280 opposite last page

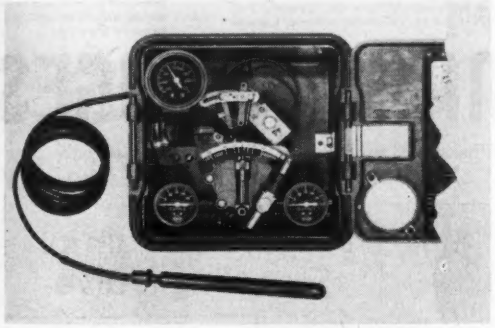
Gives positive fluid control through diaphragm valves based on temperature . . .

allows either 100% throttling action or "on-off" snap action within a wide range

Uses: As pilot to translate variations of temperature directly into flow control through diaphragm-operated valves.

Features: Temperature controller permits either 100% throttling action or "on-off" snap action within a wide range.

Description: Instrument uses external vapor-pressure thermal system to actuate power unit in pilot. Movement is generated through a Bourdon tube and linkage. Tube is calibrated to deliver increments of movement for thermal range of instrument. Unit has two pressure gages and a temperature indicator built into pilot case. Four bulb ranges cover temperatures from 0-100°F,



Two pressure gages and a temperature indicator are built into pilot case

40-140°F, 40-240°F, 100-350°F. Standard copper capillary tubing is eight feet long, although unit can be used with other lengths up to a maximum of 35 feet. One model of unit covers a pressure range to 5000 pounds and provides an automatic cut-off of power supply from any flow line in case of a line break.

(Type 1460 Temperature Controller is product of Black, Sivalls, & Bryson, Inc., Dept. CP, 7500 E. 12th St., Kansas City 26, Mo. . . . or for more information check CP 5281 on form opp. last page.)

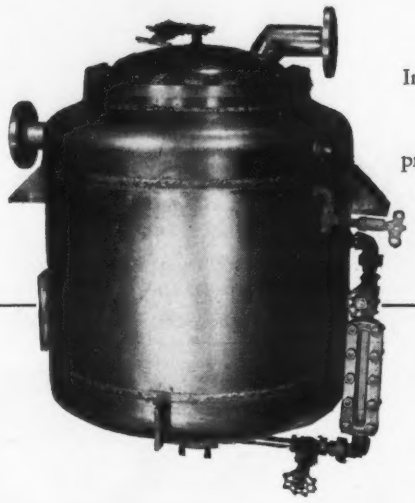
Shows how to make copies quickly by xerography

Illustrated six-page brochure is printed in two colors. It describes copying by xerography process and details cost per copy.

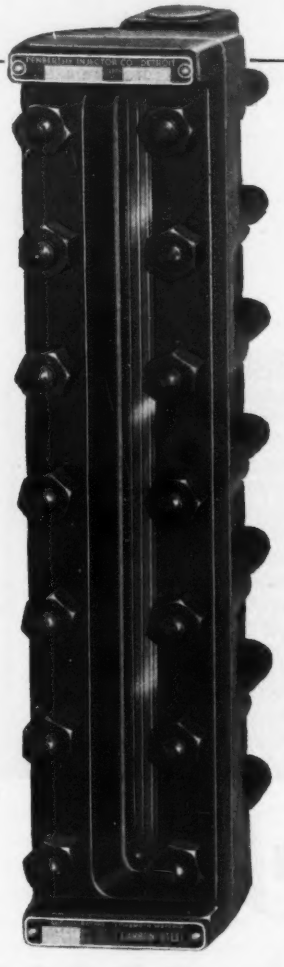
Bul X-263 is issued by The Haloid Company, Dept. CP, 2-12 Haloid St., Rochester 3, N.Y. Specify CP 5282 on form opposite last page.

Where a drop of water

can be fatal . . .



In freezing temperatures at high altitudes, even a trace of water in the gas can cause engine failure. This Filter/Separator successfully removes the last death-dealing drop. It is a product of Bendix-Skinner Division of Royal Oak, Michigan, contractor to the U. S. Navy. Notice that it is equipped with a Penberthy Liquid Level Gage.



BENDIX-SKINNER CHOSE PENBERTHY LIQUID LEVEL GAGES

In handling volatile aviation gasoline, two special factors stand out in the selection of gages. They *must* be corrosion-resistant and sparkproof. The Penberthy all-bronze non-magnetic reflex gages used on this installation fill the bill perfectly on both counts. In addition, they offer features found only in Penberthy gages. Features which save time and money on installation and maintenance — provide long, trouble-free service.

So, whether you order from the standard line or require special designs for specific installations, you are *certain* of satisfaction when you order Penberthy. Write for your copy of Catalog 35.

PENBERTHY INJECTOR COMPANY
Division of the Buffalo-Eclipse Corporation
1242 Holden Avenue Detroit 2, Michigan

***There's Certain Satisfaction in* PRODUCTS BY PENBERTHY**

- GAGES
- EJECTORS
- EDUCTORS
- EXHAUSTERS
- SYPHONS
- ELECTRIC SUMP PUMPS
- CYCLING JET PUMPS
- INJECTORS

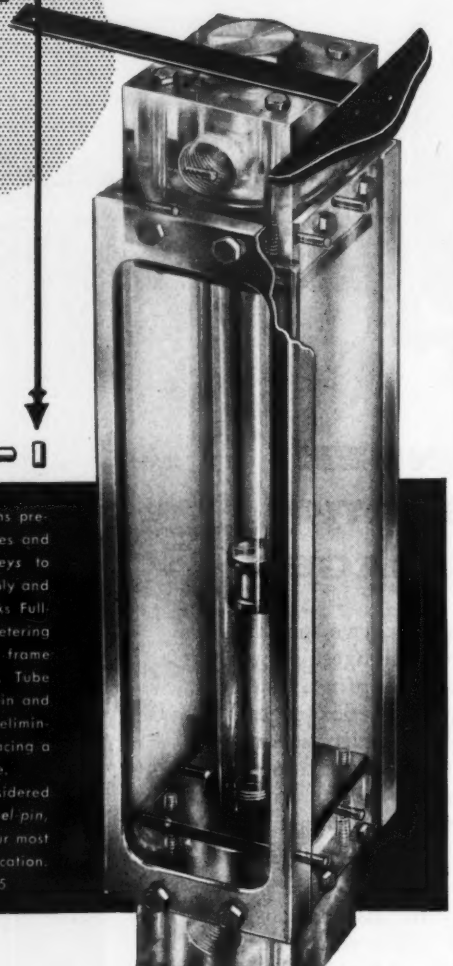
When inquiring check CP 5283 opposite last page

BROOKS LEADERSHIP *achieved by design*

dowel-pins are the difference

NO TORQUE

NO LINE STRAIN



8 stainless steel dowel-pins precisely align the side plates and end fittings, are the keys to quick, trouble-free assembly and maintenance of the Brooks Full-View* Rotameter. The metering tube is installed after the frame is completely assembled. Tube breakage due to line strain and misalignment is thereby eliminated. It's as simple as placing a round peg in a round hole.

This feature, if considered alone, would make dowel-pin, side-plate construction your most important rotameter specification.

Send for Bulletin 115

*Trade-Name

TM

a complete line... **BROOKS**

ROTAMETERS ...*for every service*

BROOKS ROTAMETER COMPANY

103 EIGHTH STREET • LANSDALE, PA.

When inquiring check CP 5284 opposite last page

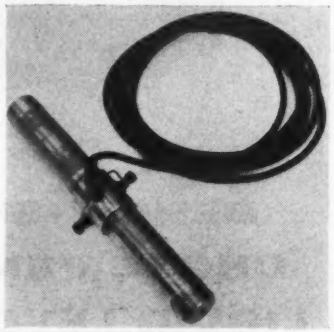
Detects salt water or pollution in wells . . .

conductivity cell is weighted for use in fast streams

Uses: Detecting salt water intrusions or presence of pollution in streams and wells.

Features: Conductivity detector is portable and has weighted conductivity cell for use in deep wells or fast streams.

Description: Electrolytic conductivity instrument is portable AC bridge which is battery-operated. Bridge covers range of conductance from 40-40,000 micromhos. Instrument uses both eye null indicator and earphones to detect bridge balance. Scale for temperature measurement from 32° to 122°F is included.



Call is weighted for checking deep wells

(RB-188-1 Solu-Bridge is product of Industrial Instruments, Inc., Dept. CP, 89 Commerce Road, Cedar Grove, N. J. Check CP 5285 on form opposite last page.)

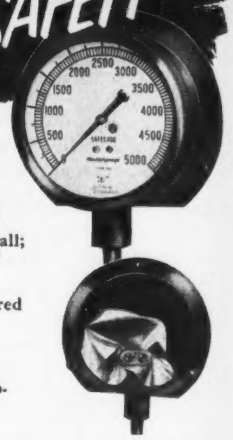
1956 standard specs for power supplies

Printed in two colors, four-page bulletin illustrates and describes 16 power supplies for various electrical requirements. Thumbnail specs are included.

1956 Power Supply Catalog is issued by Sorensen & Co., Inc., Dept. CP, 375 Fairfield Ave., Stamford, Conn. Specify CP 5286 opposite last page.

New advance in...

GAUGE SAFETY



Another Marsh development... new "SAFE-CASE" gauge for those conditions where over-pressures of explosive force can occur.

Face well protected by solid metal wall; but, still more important, *entire back* is thin metal plate that opens out to exhaust any abnormal pressure.
In testing, heavy blank cartridges, fired within back of case, did not even break crystal.
Use "Safecase" for your toughest services. It is standard in Marsh "Mastergauge"—the highest development in pressure gauges.
Ask for facts.

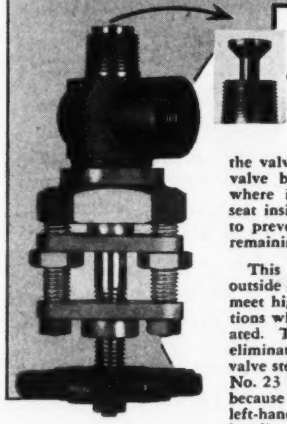
MARSH INSTRUMENT CO.,
Sales affiliate of Jas. P. Marsh Corp.
Dept. Z, Skokie, Ill.
HOUSTON BRANCH PLANT: 1122 Rothwell St.
Sect. 15, Houston, Texas
Marsh Instrument & Valve Co. (Canada) Ltd.,
8407 103rd St., Edmonton, Alberta, Canada

Test Proves Safety
Explosive force of cartridge merely opens out safety-release back. Back is firmly attached to case and cannot be dislodged during a pressure blow-out.

MARSH GAUGES

When inquiring check CP 5287 opposite last page

New! Jerguson Drain or Sampling Valve



- completely self-draining
- withstands severe conditions
- foolproof operation

The new Jerguson No. 23 Drain or Sampling Valve is completely self-draining, for the valve stem seats on the outside of the valve body. It is ideal for installations where it is desirable to have the valve seat inside the wall of the vessel in order to prevent the typical condition of liquid remaining in the nipple and valve inlet.

This rugged, new Jerguson Valve has outside screw and yoke construction to meet high temperature or corrosive conditions where inside threads cannot be tolerated. The efficient outside thread design eliminates possible freezing and allows the valve stem to work freely at all times. The No. 23 Valve provides foolproof operation because the stem is constructed with a left-hand thread, thus allowing the valve handle to operate in the normal direction of standard valves.

Write for data unit and complete details

JERGUSON

Gages and Valves for the Observation of Liquids and Levels

JERGUSON GAGE & VALVE COMPANY
100 Fellsway, Somerville 45, Mass.
Offices in Major Cities. In Canada: Peacock Bros. Ltd.
In England: Jerguson Tress Gage & Valve Co. In France: Pétrole Service

When inquiring check CP 5288 opposite last page

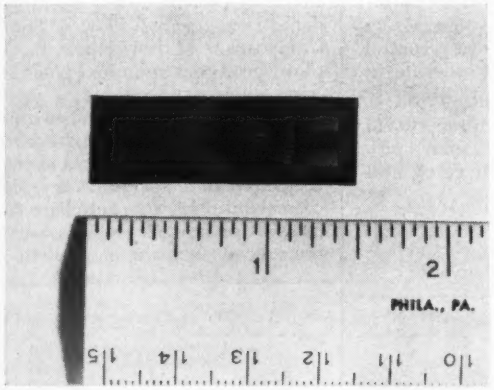
Strain gages of foil for trial use

Allows fabrication of special gages in any two-dimension pattern

Uses: For experimental and trial work in any conceivable two-dimensional pattern for electrical measurement of forces and weights.

Features: Resistance strain gages are made of metal foil and are flexible enough to use on curved or contoured surfaces.

Description: Gages consist of a 0.0005-inch thick copper-nickel foil grid on an epoxy resin backing. Active grid dimensions are 1 x 11/32 inch and mounting dimensions are 1½ x ½ inch. Nominal resistance is 119 to 121 ohms per package of 10 gages having a resistance tolerance of ±0.2 ohms. Gage factor is approximately 2.20. Application procedure is approximately the same as for SR-4 wire gages. Gages are for use at normal atmospheric temperatures.

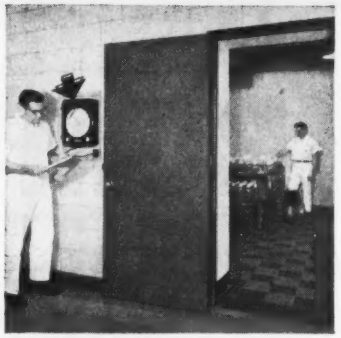


Mounting dimensions of foil strain gage are 1½ x ½"

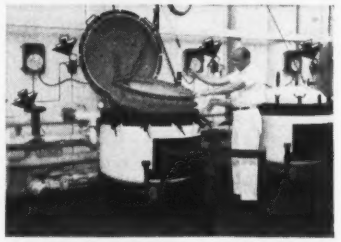
Foil strain gages allow fabrication of special purpose gages which may be impractical or impossible with wire. Foil gages will withstand higher currents than wire gages of comparable resistance, because of greater surface area for heat dissipation. Simplified installation with less or no amplification may be possible in special applications. Strain gages are supplied in kits including 20 gages, cement, working tools, instructions.

(Foil strain gages are product of Baldwin-Lima-Hamilton Corp., Dept. CP, 940 Simpson St., Eddystone 42, Pa. Check CP 5289 opposite last page.)

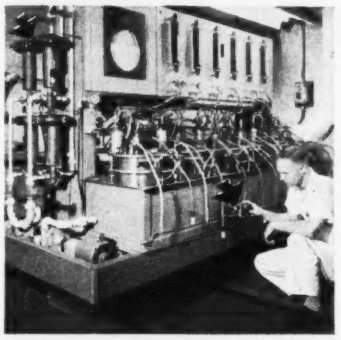
Weighing operations? Estimate cost of scale errors — fast. See nomograph on page 216



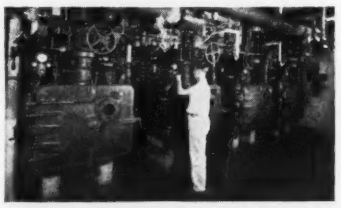
Shaker room and incubator in Fermentation Department. Powers Temperature Recording Controllers are used here.



Ampoule Sterilizers regulated by Powers No. 252 Pressure Regulators and Valves.

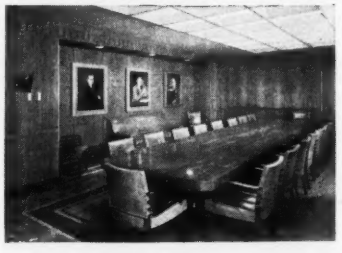


Fermentation process in research pilot plant controlled by Powers ACCRITEM Regulators and FLOWRITE Valves.



Vacuum Freeze Dryers equipped with Powers No. 26 Temperature Controllers.

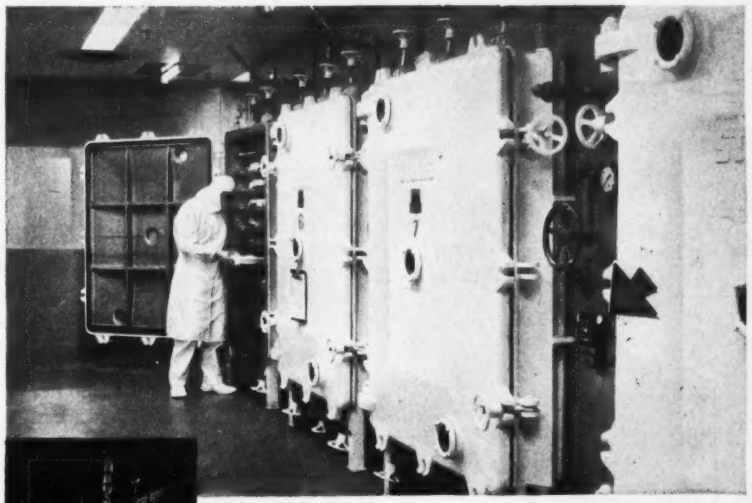
Below: Air Conditioned Room for Board of Directors and executive conferences.



POWERS

AUTOMATIC temperature, humidity and pressure control

.... helps Abbott Laboratories bring better health to millions



Many materials used in Abbott's more than 700 products are produced in the above Vacuum Dryers regulated by Powers No. 26 Temperature Controllers.

Research at Abbott's has paid off in an unbroken dividend record, numerous stock dividends and splits. Many of their famous products such as Nembutal, Pentothal, Erythrocin, Iberol, Vi-Daylin, Selsun and Sucaryl have been developed in laboratories equipped with Powers control.

Versatility of Powers control used at Abbott's is indicated by some of the applications shown here and in the following installations: Air conditioning control systems for auditorium with 900 seating capacity, executive offices and dining room, cafeteria and animal rooms; also controls for tablet machines, demineralized water heaters, autoclaves and many other applications.

When you need automatic control for temperature, humidity or pressure, call your nearest Powers office or write us direct. An experienced Powers engineer will gladly help you select the right type of control and the proper size control valves.

(c42)

THE POWERS REGULATOR COMPANY

SKOKIE, ILLINOIS | *Offices in chief cities in U.S.A., Canada and Mexico*

Over 60 years of Automatic Temperature and Humidity Control

When inquiring check CP 5290 opposite last page

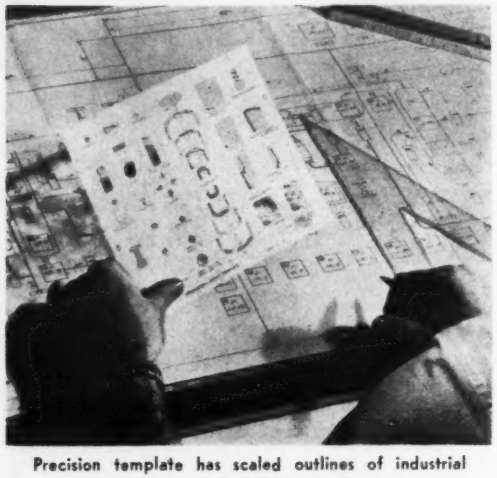
Precision-cut template reduces time required for design . . .

has scaled outlines representing most used industrial instruments at 2″ to the foot

Uses: For laying out complicated graphic panels on the drawing board.

Features: Layout template has scaled outlines representing most frequently used industrial instruments, accurately scaled at 2″ to the foot.

Description: Layout template is fabricated from 20-gage, frosted acrylic plastic. In addition to



Precision template has scaled outlines of industrial instruments

outlines of industrial instruments, symbols for pumps, valves, other graphic panel symbols are included. Template was developed by manufacturer for use by its own drafting department. Template now has been made available as a service.

(To obtain Panelgraph Layout Template remit $5.00 direct to Panellit, Inc., Dept. CP, 7401 N. Hamlin Ave., Skokie, Ill. When inquiring specify CP 5291 on form opposite last page.)

Prints numbers or letters according to control in remote spot . . .

pulse selects position on print wheel to identify occurrences on recorder chart

Uses: Identifying range, chart speed, channel number, other variations that need to be identified when strip chart is later reviewed.

Features: Strip chart printer allows numbers or letters to be selected from remote location.

BRISTOL'S INSTRUMENTATION

BRISTOL ELECTRONIC DYNAMASTERS will measure and automatically control any variable — from temperature to viscosity

ANY VARIABLE that can be translated into an electrical quantity — temperature, pressure, pH, voltage, speed, smoke density, resistance, and hundreds of others — can be measured, recorded, and automatically controlled by Bristol's Electronic Dynamaster® Potentiometer and Bridge instruments.

Whatever your measurement or automatic control problem may be, whether it be in the plant, laboratory, or pilot plant, there is a Bristol Electronic Dynamaster for it.

ADVANTAGES of the Bristol Electronic Dynamaster:

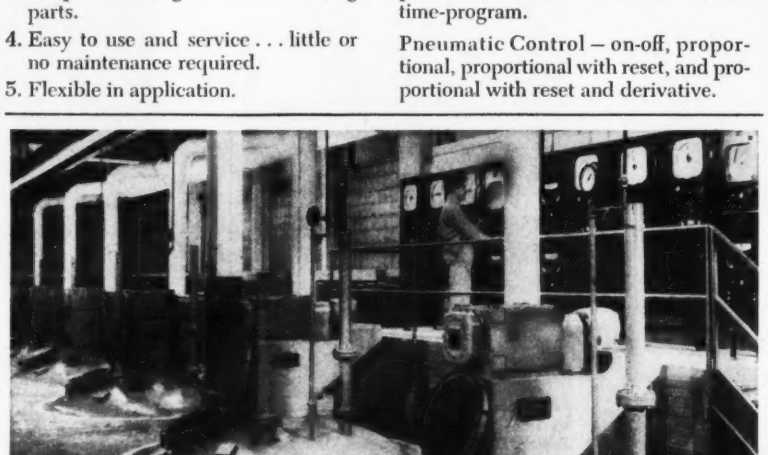
1. Continuous standardization with no dry cells, eliminates need for dry cells and standardizing mechanism — Results: no interruption to control, no batteries to replace.
2. High accuracy . . . fast operation . . . continuous electronic measurement.
3. Simple in design . . . few moving parts.
4. Easy to use and service . . . little or no maintenance required.
5. Flexible in application.
6. Rugged in construction . . . especially built for industrial plants, pilot plants, and for research and laboratory use . . . unaffected by vibration.
7. Plant operating men quickly become familiar with this instrument and like to use it.

MODEL FOR EVERY REQUIREMENT. Dynamaster Potentiometers and Bridge Instruments are available as single-pen, two-pen, and multiple-record (up to 24 points) strip-chart instruments and as round-chart instruments.

ELECTRIC AND PNEUMATIC CONTROLLERS. Both strip-and round-chart instruments are made in a very wide variety of controllers that meet every control requirement, including the following in a great many forms:

Electric Control — on-off, proportional input, 3-position, proportioning, proportional with automatic reset, and time-program.

Pneumatic Control — on-off, proportional, proportional with reset, and proportional with reset and derivative.

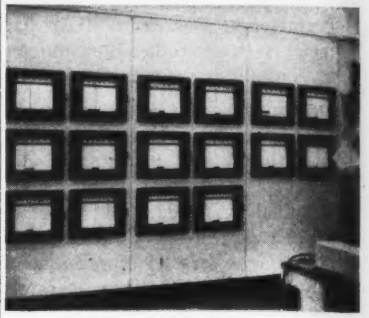


LIQUID LATEX TEMPERATURE is controlled precisely to remove ammonia from natural latex prior to foaming in this plant.

Automatic plant uses Bristol's Dynamaster Instruments

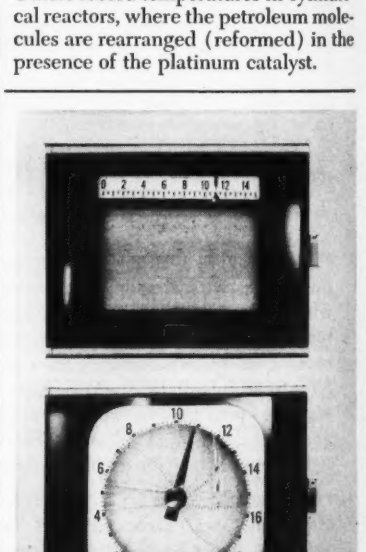
Automation is a reality here at the Buffalo Foam Rubber Products plant of the Dunlop Tire and Rubber Corporation. This automatic plant, designed and built by Mechanical Handling Systems, Inc., Detroit, uses Bristol Dynamaster Electronic Instruments and Automatic Controllers as part of a process employing today's most advanced automatic production techniques. The result — greater efficiency and productivity, lower costs, improved product.

Sun Oil Plant uses Dynamaster Recorders



Dynamaster Multiple-Point Temperature Recorders are used in the Control Room of the huge new 15-million-dollar Petrochemical Plant of Sun Oil Company at Marcus Hook, Pa. The plant produces chemical grade benzene, toluene, and xylenes.

Some of the instruments shown measure the temperatures of feed stock into and out of heaters, at dozens of points. Others record temperatures in cylindrical reactors, where the petroleum molecules are rearranged (reformed) in the presence of the platinum catalyst.

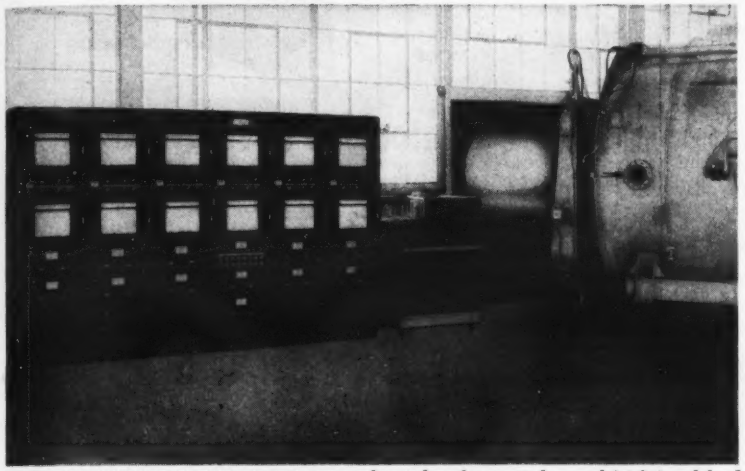


BRISTOL'S DYNAMASTER INSTRUMENTS are available with strip or round chart. Same instrument except for chart drive.

NEWS

. . . news and information about automatic controlling, recording and telemetering instruments from Bristol

. . . leaders in human-engineered instrumentation



BRISTOL'S DYNAMASTER INSTRUMENTS record test data from wind tunnel (right) and feed information to card punching machines at United Aircraft's Research Dept.

Bristol's Dynamaster Recorders feed analogue-to-digital converters

At United Aircraft Research Dept., Bristol's Dynamaster Recorders not only supply high-speed chart records of wind tunnel tests but feed analogue-to-digital converters that punch test data on cards, at 100 cards per minute, for analysis by electronic computers.

Dynamasters in this installation record the output of strain gauge pick-ups placed on test models in the wind tunnel. The models are subject to air at supersonic-velocities.

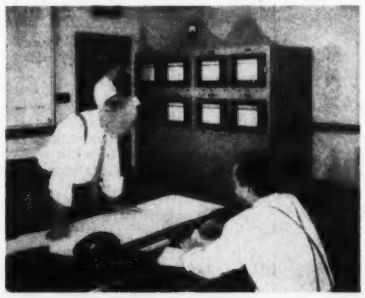
High-speed Dynamaster Recorders (1-second full-scale pen travel) inform test operators of test conditions *between* card punchings. Since the test only lasts from 10 to 20 seconds, it is vital that every bit of information be gathered for analysis.

Dynamasters aid gas dispatching in Midwest

Bristol Dynamaster Metameter Telemeters, at a large midwestern gas utility, help gas dispatchers route gas throughout their distribution system.

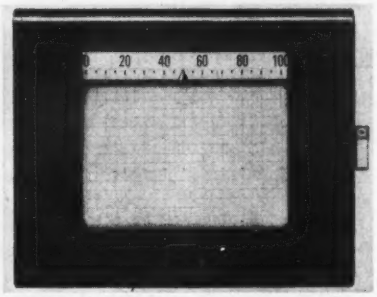
These strip-chart Dynamaster Metameter Telemeters record gas pressure at strategic points in the system. This information used to be called in periodically by field men—a slower and less accurate process.

Using the continuous, accurate, up-to-the-minute information supplied by the wide-strip telemeter receivers, the gas dispatcher effects much better pressure regulation in the gas supply than with the old system—particularly during periods of unexpected demand.



New high-speed electronic Dynamaster Recorder

0.4-second for full scale pen travel



NEW 0.4-SECOND Dynamaster recorder

Freedom from overshoot on long or short traverses is a key feature of Bristol's new high-speed Dynamaster Recorder.

This high-speed instrument sets new standards for chart recorders in the fields of rocket and jet-engine testing, wind tunnel measurements, automatic-machine-tool control, scientific laboratory testing and numerous industrial applications.

SPECIFICATIONS:

Speed: **0.4 second to within 0.25% of balance for full-scale step-response without overshoot.**

Sensitivity: **Dead band less than 0.1% of full scale.**

Ranges: **Minimum range of 1 millivolt d-c.**

Chart: **12¼ in., 11 in. calibrated.**

Chart Speeds: **Up to 4 in. per second.**

No matter what your measurement problem is, a Bristol Dynamaster Potentiometer or Bridge instrument will solve it for you.

Write for all the facts

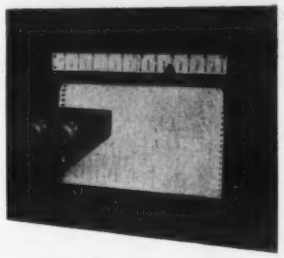
To get the whole story on these rugged, precision instruments, write today for your free copy of the 36-page bulletin P1245. The Bristol Company, 141 Bristol Road, Waterbury 20, Conn.

5.24

.. WHAT'S NEWS AT BRISTOL... WHAT'S NEWS AT BRISTOL... WHAT'S

When inquiring check CP 5292 opposite last page

Description: Print wheel on unit can have 8, 10, 12, 18, or 24 positions. Position is selected from remote point and then caused to print on strip chart. Instrument can have two print wheels if necessary, each independent, and separate remote switches. Unit can be made to operate on AC or DC voltage from 24 to 110 volts. Installation kit consists of strip of rubber for chart platen, mounting screws, plexiglass window to replace original one in recorder door, plastic transparent cover for unit itself, and instructions for installation.



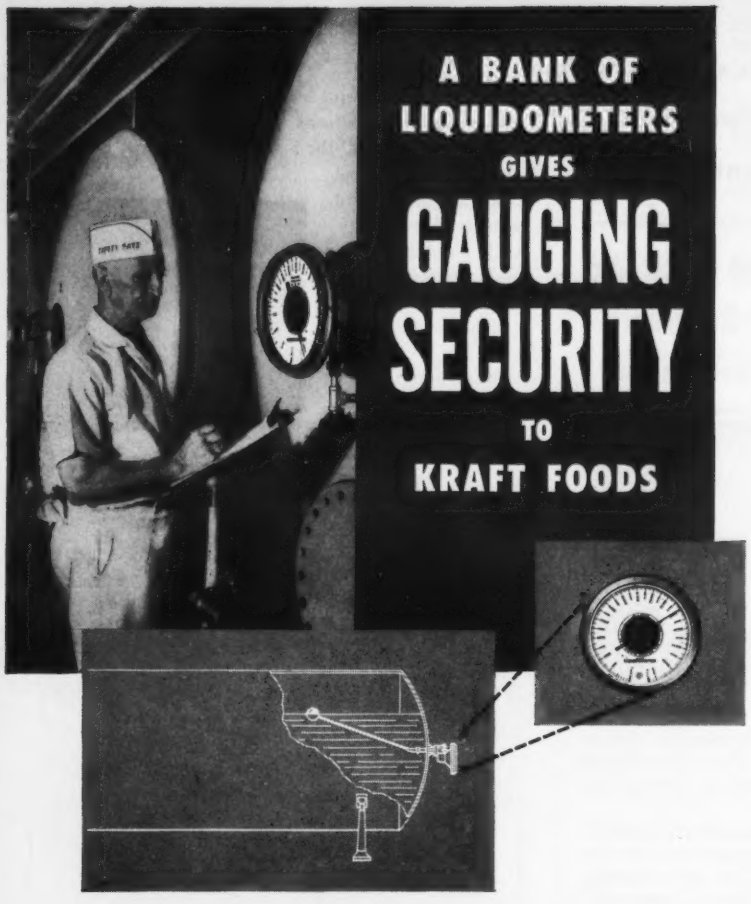
Identifies chart range, chart speed, channel number for chart review

(RI-3 Identichart is product of Royson Engineering Co., Dept. CP, Hatboro, Pa. . . . or for more information check CP 5293 opposite last page.)

Check indicator lights with "press-test"

Two-terminal indicator or warning lights have built-in "press-to-test" circuit for critical warning light applications. Lamp circuit is insulated from case. Lamp can be used to test stand-by or alternate circuits in instrument or test installations. Miniature lamps are mounted inside a long plastic lens. Pressing the lens opens one light circuit and closes another circuit. Lens color can be amber, blue, green, red, white.

(Indicator lights are product of Hetherington, Inc., Dept. CP, 1200 Elmwood Ave., Sharon Hill, Pa. . . . or check CP 5294.)



A BANK OF LIQUIDOMETERS GIVES

GAUGING SECURITY

TO KRAFT FOODS

At the new Kraft Foods plant in Hillside, N. J., Liquidometer gauges supply an accurate, reliable measure of vegetable oils which are fed into the Kraft food processing system.

The gauges used by Kraft are 12" direct readers. Their function: gauging the contents of the 24 tanks in which Kraft stores vegetable oils at 100-120 degrees F. The slightest change in liquid level is instantly and automatically transmitted to a large, easy-to-read dial. Inventories are accurately maintained with a minimum of effort.

Liquidometer direct readers are available with automatic warning signals where certain liquid levels are critical. Dependability, low maintenance, high readability, safety and ease of installation ideally suit Liquidometers for every liquid gauging need.

A variety of dial type Liquidometer gauges are available for direct and remote indication. For complete details write Dept. H for Bulletin 463.

LIQUIDOMETER INSTRUMENTS

Liquids worth storing are worth measuring.

THE LIQUIDOMETER CORP.

SKILLMAN AVENUE AT 36TH STREET, LONG ISLAND CITY 1, N. Y.

When inquiring check CP 5295 opposite last page

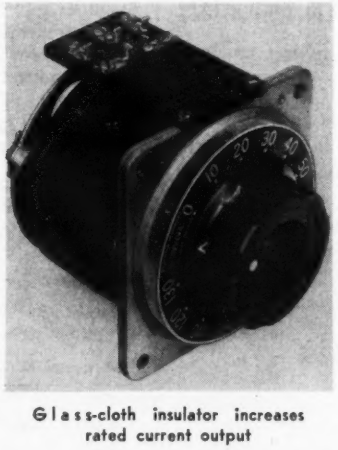
Autotransformer rating upped by 20%, now 6 amp . . .

unit also has extended rectangular flange mounting

Uses: As adjustable transformer to reduce input voltage from 115 or 230v AC as required.

Features: Basic model of autotransformer has rating of 6 amp and an extended rectangular flange mounting, easily adaptable to motor drives.

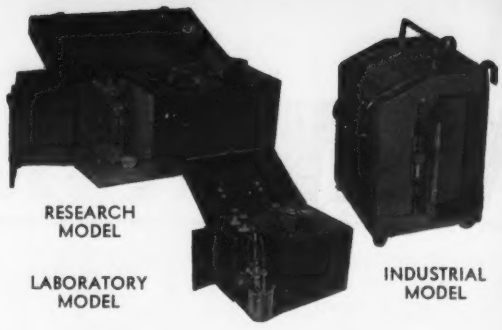
Description: Square base assembly is built up of two identical stamped pieces of aluminum alloy. Base allows surface mounting and post-type ganging. Mounting holes match manufacturer's type V5, allowing interchangeability. Glass-cloth insulator is between coil and base for improved thermal coupling. Rated output current is thus increased 20% — to 6 amp.



Glass-cloth insulator increases rated current output

One model is intended for wall or panel mounting and is provided with conduit knock-out. A second model is a bench and portable unit complete with input cord, switch, output plug. Special assemblies can be made of 2-gang and 3-gang models.

(Type W5 Autotransformer is product of General Radio Co., Dept. CP, 275 Massachusetts Ave., Cambridge 39, Mass. . . . or for more information check CP 5296 on form which is located opposite last page.)



Cambridge pH Meters

The three portable models illustrated above incorporate new and important advantages. A.C. line operation eliminates battery nuisance. Laboratory and Research models use electron-ray tube for precise null-point indication. Industrial model is direct-reading, continuous-indicating; ruggedly built for plant use.

Accuracy: Research .02 pH, Laboratory .05 pH, Industrial .10 pH. Cambridge pH equipment also includes single- and multi-point indicators and recorders. Send for Bulletin 910-M.

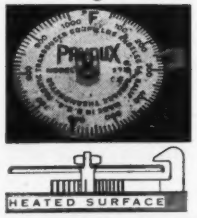
CAMBRIDGE INSTRUMENT COMPANY, INC.

3512 GRAND CENTRAL TERMINAL, NEW YORK 17, N. Y.

Pioneer Manufacturers of PRECISION INSTRUMENTS

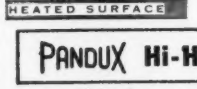
When inquiring check CP 5297 opposite last page

Easy TO OBTAIN SURFACE TEMPERATURES UP TO *1000°F* with PANDUX® SURFACE TEMPERATURE THERMOMETERS



PANDUX® **Spot-Chek Thermometer**

ALL STAINLESS STEEL 50° F. to 1000° F. Easy to read—fast—compact. Accuracy to ± 2% for all surface temperatures such as dies, hot plates, etc. Also for ovens and other enclosed spaces. User can reset, if necessary. Diameter 1¾", weight ⅓ oz. Net price $3.00.



PANDUX® **Hi-Heat**

Designed for fast, accurate check of all hot surfaces from 50° F. to 750° F., for hot plates, platens, dies, molds, ovens, furnaces — either flat or rounded surfaces. Thermometer is affixed by two Alnico magnets. Highly practical in a wide variety of industrial applications — sells for $6.75.

PANDUX® **Surface Thermometer**

Standard with industry for easy measurement of surface temperature, compact, low cost, accurate ± 2° over entire range. Three ranges: −50° F. to 250° F., 0° F. to 300° F., 70° F. to 370° F. Also in Centigrade. Price $6.75.

ALSO PANDUX PIPE THERMOMETERS

Your order will be filled through your nearest dealer. WRITE DEPT CP-56

PACIFIC TRANSDUCER CORP.

11836 West Pico Blvd. — Los Angeles 64, California

When inquiring check CP 5298 opposite last page

Simplicity of computer allows fast training of operators . . .

engineer without computer training can operate in three days

Uses: As simplified computer that can be moved as required.

Features: General purpose computer does not require any air-conditioning or special installation facilities.

Description: Computer uses magnetic drum for storing 4096 words, 31 bits in length, along 64 tracks around drum circumference. Drum rotates at a speed of 3600 rpm and is scanned by 64 read-

Electric typewriter is input-output unit for computer

record heads. Computer can add, subtract, multiply, divide, and make decisions as instructed by internally stored programs. Electric typewriter is input-output device. Computer operation can be learned in approximately 30 minutes by engineer familiar with basic computing techniques. Engineers without computer training can learn to operate the machine in approximately 3 days.

(LGP-30 Computer is a product of Librascope, Inc., Dept. CP, 808 Western Ave., Glendale, Calif. Check CP 5299 on form opposite last page.)

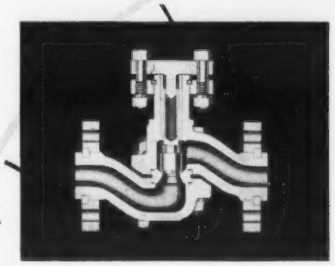
Describes control systems for pulp handling

Two data sheets totaling eight pages discuss instrumentation systems for pulp cooking and washing. Schematics are used to explain operational principles. Photographs show principal control units.

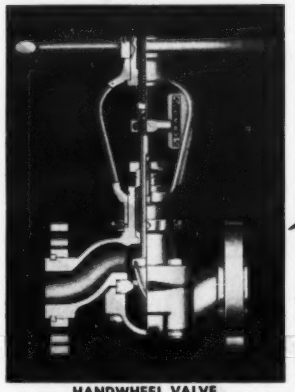
AED 260-40 and 260-60 are issued by The Foxboro Co., Dept. CP, 86 Neponset Ave., Foxboro, Mass. Specify CP 5300 opp. last page.

AROUND-THE-CLOCK RELIABILITY with Annin

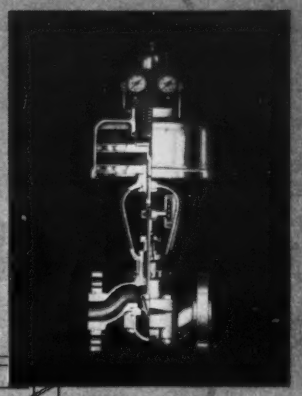
The complete line of Fluid Control Valves to meet every installation requirement



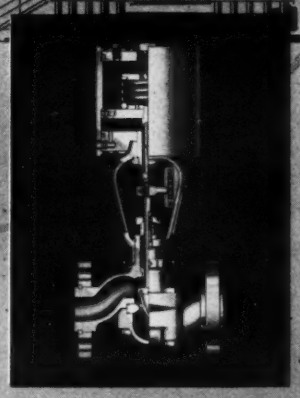
CHECK VALVE



HANDWHEEL VALVE



DOMOTOR VALVE



CYLINDER VALVE

Yes, *Annin* offers design and control engineers a complete line of valves for rugged and reliable performance "around-the-clock." Name the installation—rocket stand, aircraft component test facility, chemical plant, refinery, paper mill or power plant—and *Annin* valves will exceed the most critical performance needs, with features like:

- **Piping flexibility**
- **Pressure ratings to 10,000 PSI**
- **Body designs for gases to molten metals**
- **Temperatures from −400°F to +1600°F**
- **Interchangeable operators—Domotor, Cylinder or Handwheel**

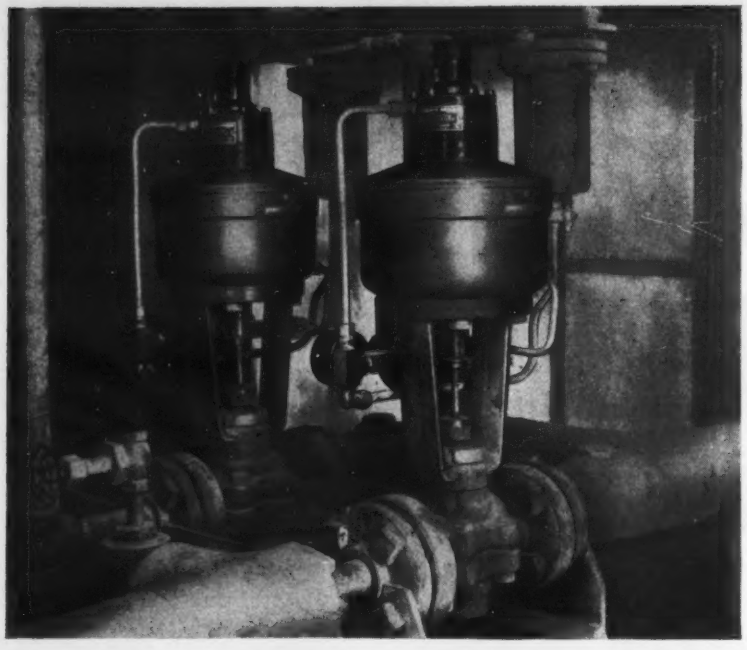
ANNIN'S new and comprehensive valve catalog 1500-C is now ready for distribution. Send for your copy today.

Annin

ANNIN Control VALVES

THE ANNIN COMPANY
6570 EAST TELEGRAPH ROAD, LOS ANGELES 22, CALIFORNIA

When inquiring check CP 5301 opposite last page



600 to ONE CUSTOMER PROVES SATISFACTION...

THAT'S THE STORY BEHIND THESE CONOFLOW Series LB CONTROL VALVES

Photo shows an original installation of Conoflow Series LB Control Valves that has been on a temperature control application for several years. There are now over 300 of these valves in operation at this large manufacturing plant. By the end of the year there will be approximately 600 LB valves throughout the plant. Out of respect for our customer's company policy we cannot publish the name. However, the volume of valves involved proves that Conoflow Series LB Control Valves are eminently satisfactory to this prominent user.

The tandem operation shown is a typical application—cooling and heating—utilizing split ranges. One valve handles cold water with a 3-9 psi range. The other handles steam with a 9-15 psi range.

The revolutionary Cylinder Conomotor provides greater speed of response, tight shut-off and other performance characteristics superior to conventional valves. Downtime is practically nil compared with other valves.

Conoflow Controls
FOREMOST
IN FINAL CONTROL ELEMENTS

Catalog LB-1 tells the complete story of the benefits in Conoflow Series LB Control Valves. Write for your copy. Conoflow representatives are located in most principal cities.

CC-602

CONOFLOW CORPORATION
SUBSIDIARY OF WALWORTH COMPANY
2100 ARCH STREET • PHILADELPHIA 3, PA.

When inquiring check CP 5302 opposite last page

Has sealed elements in thermocouple for safety . . .

gives protection under pressure in case of rupture

Uses: As primary element for measurement of temperature from −300°F to 1850°F under pressures to 3000 psi.

Features: Thermocouple assembly provides protection in case of well rupture.

Description: Butt-welded thermocouple is bottomed in formed tip of small-diameter well. Thermocouple elements are completely sealed into well under positive pressure. Well is silver-soldered or welded to safety pressure seal as required. No. 301 stainless steel is used for well. Special metals can be used for welds for exceptionally corrosive applications. Heavier wells are available with greater physical strength for pressures as high as 20,000 psi. Thermocouple elements are available in copper-constantan, iron-constantan, and chromel-alumel.

(Safetywell thermocouple assembly is product of Conax Corp., Dept. CP, 7811 Sheridan Drive, Buffalo 21, N. Y. Check CP 5303 on form opposite last page.)

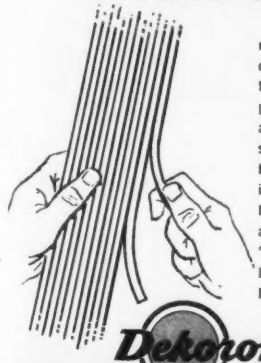
Shows portable recorders for humidity

Printed in two colors, six-page illustrated bulletin describes portable roundchart recorders for humidity. Typical charts are reproduced in bulletin.

Bul H1008 is issued by The Bristol Co., Dept. CP, 127 Bristol Rd., Waterbury, Conn. When inquiring specify CP 5304 on form opp. last page.

DEKORON RIBBON

individually sheathed instrument tubes that install in a fraction of the usual time



Dekoron Ribbon is a new concept in multiple tube instrument line—a strip of 10 copper, aluminum, or "P" (polyethylene) tubes each individually coated with vinyl plastic. A thin "web" of vinyl attaches adjacent tubes together . . . yet is perforated so that one or more tubes can be stripped from the ribbon without tools. Thus, each individual tube is protected from corrosion by its covering while in the ribbon as well as after being peeled from the ribbon. "P" tube Dekoron Ribbon is color coded for line identification. Lengths to 500 feet. Request free literature on Dekoron Ribbon. AA-749

Dekoron® products

QUALITY • RESEARCH • SERVICE
SAMUEL MOORE & COMPANY
DEKORON PRODUCTS DIVISION • MANTUA, OHIO

When inquiring check CP 5305 opposite last page

ACCURATE

Lumenite Electronic
LIQUID LEVEL CONTROLS

With no floats—no moving parts in the container (except non-conductive liquids) these Lumenite Electronic Liquid Level Controls maintain exact levels of water, milk, syrups, etc., in tanks, reservoirs, boilers, processors, freezers — either open or under high pressure.

Clean—Sanitary
Simple to Install
Require no Servicing

Write for
Bulletin FLM—on Liquid Level Controls
Bulletin ITC—on Ice Thickness Controls
Bulletin FN—on Non-Conductive Liquids

Lumenite Automatic
TIMING CONTROLS

Lumenite Timers are the simplest, sturdiest and longest life. Accurate to fractions of a second, they speed and make more accurate all types of timed production.
For Details ask for
Bulletin LT—Standard Time Switches
Bulletin CR—Cycle Repeating
Bulletin PC—Program Clocks
Bulletin R—Time Delay Relays
Bulletin RMC—Auto. Reset Timers
Bulletin ET—Electronic Timers
Electronic or Electric Controls and Timers designed for special service.

DEPENDABLE

Lumenite Electronic Company
407 S. Dearborn St., Chicago 5, Illinois

When inquiring check CP 5306 opposite last page

Uses flexible capillary to measure temp in freezer . . .

recorder can be outside cooling unit with tubing inserted between cover and frame

Uses: As portable recording thermometer for measuring temperature inside refrigerators, freezers, coolers.

Features: Temperature recorder has flexible capillary tubing which can be inserted between door and jamb or cover and frame. Door or cover need not be opened to determine temperature.

Description: Temperature recorder has temperature-sensitive bulb in six feet of flexible tubing. Pen operating mechanism, to which capillary tubing is connected, is housed in instrument's door. Recorder can be converted from one temperature range to another simply by replacing door. Chart is driven by spring-wound clock movement, 24-hour rotation. Two ranges for remote temperature recording are available: −30°F to +50°F and 10°F to 90°F.

Portable recording thermometer is spring driven

Charts are 4½ inches in diameter. Overall size of recorder is 5½ x 4½ x 7½" high. Temperature sensitive bulb is approximately ⅜" in diameter and 3¾" long.

(Tempscribe Model TTR is product of Bacharach Industrial Instrument Co., Dept. CP, 7301 Penn Ave., Pittsburgh 8, Pa. . . . or for more informa- check CP 5307 on form opposite last page.)

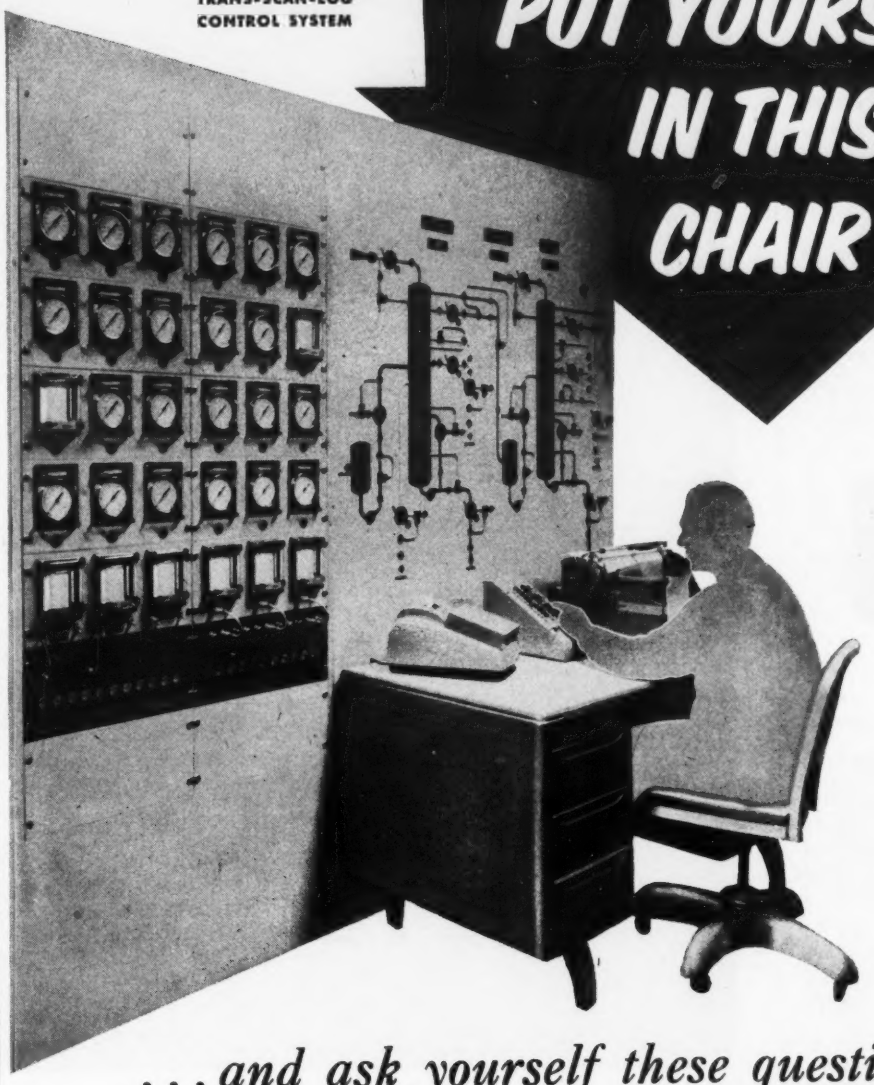
Temperature conversion chart plus element ranges

Conversion table in two colors converts °F to °C or vice versa from −460 to +4000°. Chart is printed on 8½ x 11" heavy stock, laminated for protection, and is punched to fit three-ring loose-leaf binders. Chart also shows temperature ranges of various sensing elements — thermocouples, resistance bulbs, radiation heads. Maximum limits of sensing elements for both continuous and intermittent services are shown.

Temperature conversion table is issued by Thermo Electric Co., Inc., Dept. CP, Rochelle Park Post Office, Saddle Brook, N. J. When inquiring specify CP 5308 on form opposite last page.

TAYLOR
TRANS-SCAN-LOG*
CONTROL SYSTEM

PUT YOURSELF IN THIS CHAIR



. . . and ask yourself these questions

Is scanning and logging, as I understand it, economically justified?

Perhaps not, if you're thinking just of mechanical logging of all variables, which gives little more than an accurate historical record of what has happened. But the new Taylor TRANS-SCAN-LOG System makes the operator more than a score-keeper. It enables him to instantly *visualize, evaluate* and *act upon* every processing irregularity as it occurs — without leaving his desk in front of the panel.

What effect would the TRANS-SCAN-LOG System have on my control room space and operator requirements?

It will take approximately 60% of the space normally required by a standard graphic panel *without* scanning and logging. The compactness of this "intelligence center" enables operator to supervise a greater percentage of the process. Because the scanning and logging equipment is an integral part of the process control, one operator can identify and correct any off-normal condition, as well as having a continuous trend record.

Where can I see this unit in operation?

We cordially invite you to come to Rochester to see this complete data collecting system in operation, because we believe that its many unique features *do* make it economically justified.

Your Taylor Field Engineer will be glad to make the necessary arrangements. In the meantime, write for **Bulletin 98268.** Taylor Instrument Companies, Rochester, N.Y., or Toronto, Canada.

*Trade Mark

Taylor Instruments
MEAN ACCURACY FIRST

When inquiring check CP 5309 opposite last page

Allows multiple signals to be viewed directly on one monitor . . .

moving spots of light present a dynamic bar-graph

Uses: For simultaneous viewing of electrical signals from as many as 24 points.

Features: Visual monitor is directly connected to sensitive, short-period galvanometer elements to eliminate need for multi-channel amplifiers.

Description: Visual monitor is electro-optical indicator for simultaneous viewing of pressure, temperature, strain, displacement, velocity, acceleration, others. Spots of light, moving vertically on 24 adjacent scales present a dynamic bar-graph. Spots may be visually followed from DC to a few cycles per second to peak values monitored over an entire frequency range.

Light beam galvanometers produce moving spots of light upon graph

Monitor contains two banks of hermetically sealed galvanometers, a light source, in optical system. Components are mounted in case having a translucent viewing screen as front panel. Light paths are bent to confine the long galvanometer throw into small space to maintain spot-deflection linearity. Miniature multi-pin plugs connect galvanometer channels and power through rear wall.

Screen is 3 x 4" and has scale divisions numbered 0-10 at both sides of grid. Light spots are 1/16" square. Intensity of spots is sufficient to permit photographing if permanent record is desired. Sensitivity is 0.032 ma/in scale deflection with 120 ohm

The Foxboro M/58 Consotrol Controller (shown full size, without cover). Can be panel-mounted on Consotrol Control Station, or field-mounted.

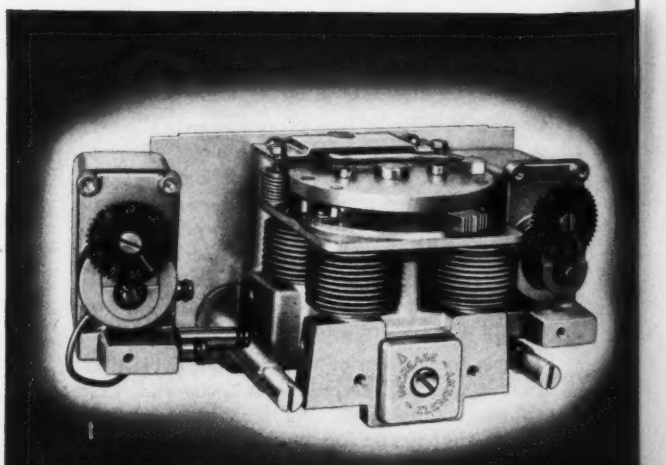
THE FOXBORO M/58 CONSOTROL ...

The M/58 Controller's Revolutionary Floating Disc System

Here's the exclusive Foxboro design development that gives M/58 Control its unique versatility, precision, and stability. The floating disc and matched bellows assure uniformly high controller sensitivity and pin-point control action, even at widest settings of the proportional band. Lever-set proportional band adjustment is calibrated to 500%.

Component Construction Gives Unrivaled Versatility

Not only is the complete controller easily detachable as a unit, but also, each component is a "plug-in" unit. For example, reset plugs in at right as shown; derivative, similarly, at left. All 4 control actions, with 2 reset ranges, are available and easily adjustable to widest variations in operating conditions. Proportional action from 1 to 500% quickly set by lever.



damping shunt. Instrument is 7 x 5 x 6¾". Weight is approximately 11 lb.

(Model 20 Dynamic Visual Monitor is product of Century Electronics & Instruments, Inc., Dept. CP, 1333 N. Utica, Tulsa, Okla. . . . or for more information check CP 5310 opp. last page.)

Up-to-date bulletin shows meters

Printed in two colors, 16-page bulletin describes electrical testing instruments, ohmmeters, frequency meters, tachometers, and related instruments.

Bul 19-56 is issued by James G. Biddle Co., Dept. CP, 1316 Arch St., Philadelphia 7, Pa. Specify CP 5311 opp. last page.

Battery uses silver-cadmium

Substituting silver for nickel with a cadmium plate, small battery is lighter than nickel-cadmium batteries of same capacity. Six amp-hr cell, for example, has a filled weight of 4.95 oz volume of 5.05 cu in, maximum of 1.25 volts, working voltage of 1.1.

(Yardney Silcad is product of Yardney Electric Corp., Dept. CP, 44 Leonard St., New York 13, N. Y. . . . or check CP 5312.)

For more information on product at left, specify CP 5313 . . . see information request blank opposite last page.

Outperforms all other controllers!

...the controller with the FLOATING DISC

If you think this claim is exaggerated, just put a Foxboro M/58 Consotrol* Controller on your process. The tougher the job, the more it will outperform other controllers! Or ask any present user . . . many of the largest, most progressive petroleum and chemical processors are using hundreds of these instruments. They will unhesitatingly confirm that this exclusive Foxboro development has put their processes "on stream", automatically and smoothly from the control room, without false starts or confusion.

The M/58 Controller can do the same for your process. The flexibility of its control functions makes it readily adaptable to *all* processing techniques. All four actions are available, with two ranges of reset . . . all are easily adjustable to the most widely varying operating conditions. For example, reset and derivative functions plug in . . . proportional action from 1 to 500% can be quickly set by a lever. And calibration is a simple zero adjustment!

Get full details on this simple, truly "universal" Controller. Write for Bulletin 13-19 and ask your Foxboro Sales Engineer for a demonstration. **The Foxboro Company, 815 Neponset Ave., Foxboro, Mass., U.S.A.**

*Reg. U.S. Pat. Off.

FOXBORO
Reg. U.S. Pat. Off.
CONSOTROL INSTRUMENTS

This Ampco Pipe has a ¾" wall, to handle sulphuric acid sludge in oil-company operation.

Sulphuric Acid Sludge No Problem

for major oil company,* in 1000-lb. transfer service

Its Ampco Pipe and Fittings resist corrosion

Ampco Pipe successfully handles problem liquids like these:

Boiling sulphuric acid (up to 50%)

Hot concentrated caustic solutions

Phosphoric and acetic acids

Phthalic anhydride

Phenols

Furfural

Brine

*Name upon request

Many other companies avoid corrosion shutdowns this same way.

Ampco Pipe is made from an exclusive aluminum-bronze alloy that . . .

(a) Resists many acids and caustics.

(b) Withstands the action of abrasive solids in suspension — resists cavitation-pitting.

(c) Has a Brinell hardness of 150 and tensiles up to 70,000 psi.

(d) Stands up under wrenches and hammers, without thread distortion and subsequent leakage.

(e) Has high velocity tolerance — flow rates of 18-20 fps.

You can get Ampco Pipe in all standard sizes, many from stock. Fittings are available to 3000 psi; flanges, to 5000 psi.

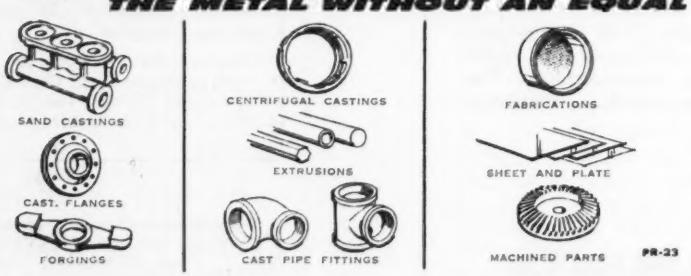
Write us concerning *your* problem.

AMPCO®

AMPCO METAL, INC.

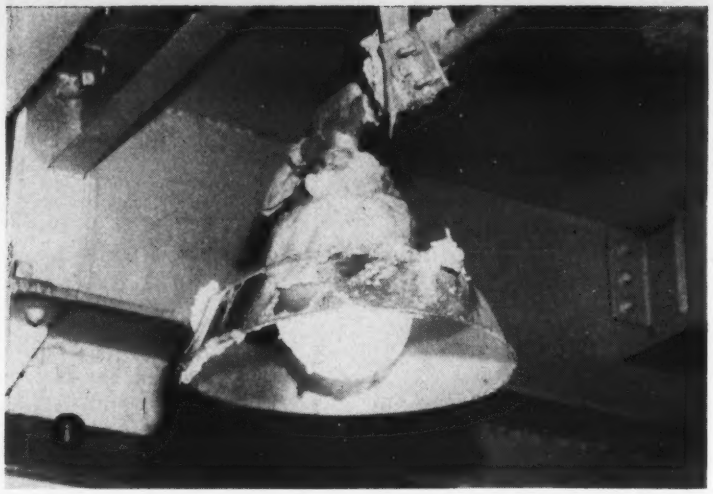
Dept. CP-5, Milwaukee 46, Wis. • West Coast Plant: Burbank, Calif.

THE METAL WITHOUT AN EQUAL



PR-23

When inquiring check CP 5314 opposite last page



While former ferrous alloy explosion-proof electrical enclosures corroded severely, causing frequent plant shutdowns —

aluminum withstands ammonium nitrate, saves plant $125,000

GORDON WEYERMULLER, Associate Editor

With **WILLIAM B. DUNWOODY,** General Operations Manager

Mississippi Chemical Company, Yazoo City, Mississippi

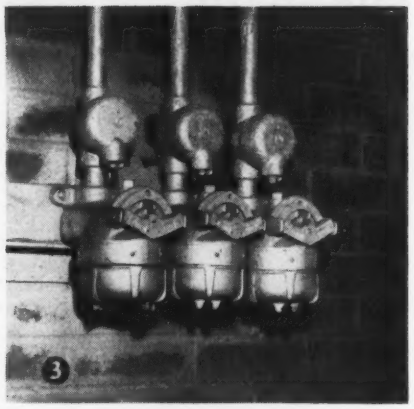
Problem: Ferrous alloy explosion-proof electrical enclosures and conduit, best for most applications, corroded severely due to exposure to ammonium nitrate at Mississippi Chemical Company. Although ammonium nitrate is not particularly corrosive when perfectly dry, it becomes extremely corrosive when moist from high humidity conditions. Corrosion of the electrical fixtures and conduit caused plant to be shut down frequently for repairs. Eventually entire electrical system had to be replaced.

Solution: In early 1953 plant was completely equipped with copper-free aluminum alloy explosion-proof electrical enclosures. All electrical fixtures installed in new additions to the plant since that time have been of the same alloy.

This copper-free aluminum alloy has been found to be the best metal available for this service from an economic standpoint. Composition of alloy usually is 95% aluminum and 5% silicon. Aluminum-magnesium alloys have also been used. Important thing is that alloy be copper-free. Aluminum is also used for the extensive electrical conduit in the plant as well as for the siding on buildings.

Results: It is estimated that use of aluminum alloy for explosion-proof electrical enclosures and conduit has saved plant about $125,000 through elimination of shutdowns and damage to electrical system. In spite of being caked with highly corrosive moist ammonium nitrate, aluminum fixtures are still in excellent condition with up to three years service. Explosion-proof fixtures prevent possible hazard from an electrical spark during the production of ammonium nitrate.

(Explosion-proof Condulet electrical enclosures of aluminum alloy are product of Crouse-Hinds Co., Dept. CP, Syracuse 1, N.Y. . . . or for more information check CP 5315 on form opposite last page.)



1 This aluminum lamp is not corroded in spite of the accumulation of ammonium nitrate on it. Fines from dryer nearby pick up moisture, causing buildup on fixture. Note breather at top

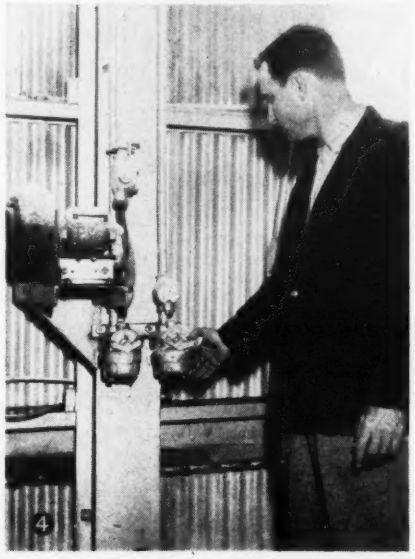
2 Explosion-proof plug and receptacle made of aluminum in ammonia nitrate bagging room. Note seal above receptacle with drain. Building siding is also of aluminum

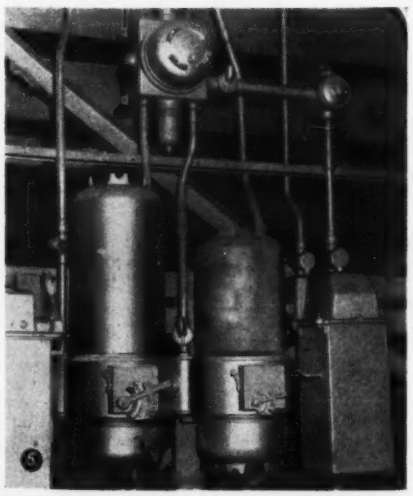
3 These aluminum starters are located directly beneath prilling tower and are constantly subjected to ammonium nitrate fines. They have been in operation about 1½ years. Note seals with drains for protection of interior of fitting

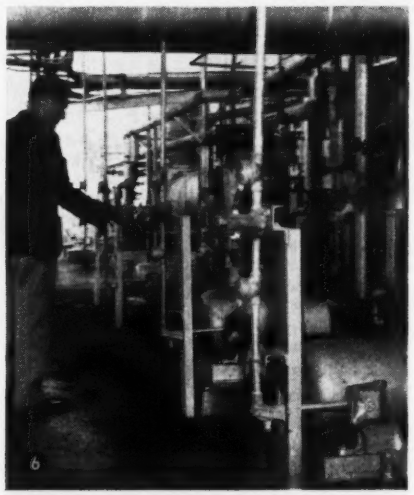
4 Start-stop station of aluminum located on third floor of ammonium nitrate building. In this area ammonium nitrate prills are coated with diatomaceous earth. Fixtures are continually subjected to the highly abrasive action of the earth besides the ammonium nitrate fines

5 Junction boxes, starters, and fittings of aluminum on this starter rack are still in good condition after three years service. Note conduit which is also aluminum

6 All of the electrical housings in this motor and pump setup for handling ammonium nitrate are made of aluminum







COROCRETE

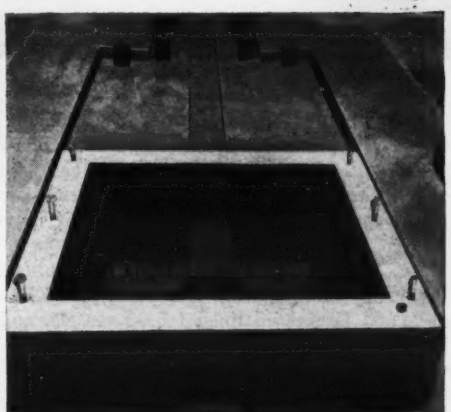
CORROSION-PROOF FLOOR SURFACING

PROVIDES GREATER PROTECTION AGAINST ACIDS AND ALKALIES

COROCRETE is 4 times stronger than concrete . . . it is resistant to abrasion . . . sets up faster than concrete . . . resists impact . . . provides positive protection against acids, alkalies and solvents . . . and COROCRETE costs less than acid-proof brick."

Here is a floor surfacing material that has been developed to meet virtually all of the conditions found in chemical and food processing, plating and metal working industries.

COROCRETE will give you greater protection . . . save you dollars . . . and last longer. Use the convenient coupon to obtain more information or a sample of COROCRETE. Write today.



Quickly and easily applied over existing concrete surfaces, COROCRETE handles like cement topping (¼ to ½-inch thickness).

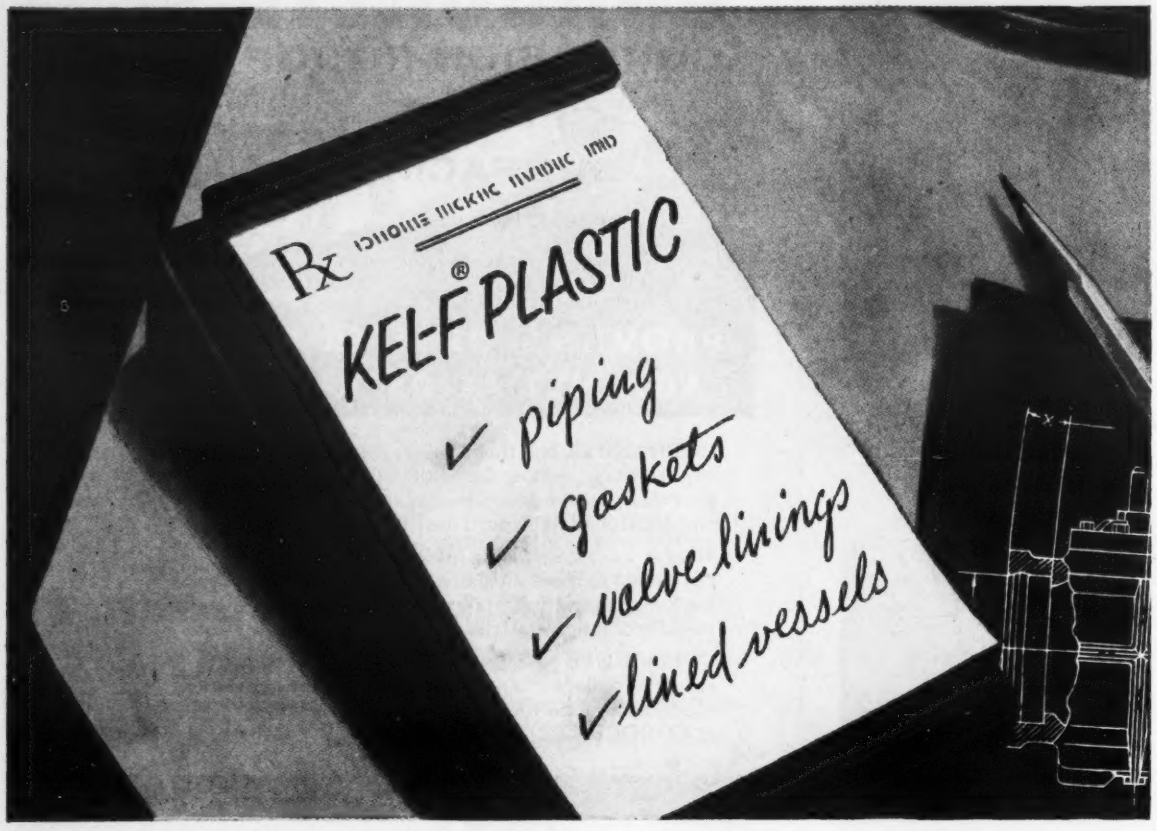
6900-CC

THE CEILCOTE CO., Inc.
Corrosion Proof Material and Construction
4834 Ridge Road • Cleveland 9, Ohio

The Ceilcote Co., Inc.
4834 Ridge Road • Cleveland 9, Ohio
Check one or both:
☐ Please send me a copy of the Brochure
☐ Please send me a sample of COROCRETE
Name _____
Company _____
Address _____
City _____ Zone ___ State _____

When inquiring check CP 5316 opposite last page

CURE FOR PRODUCT CONTAMINATION / EQUIPMENT CORROSION



ONE OF THE HAZARDS of equipment corrosion is the resulting contamination of the product being processed. In such critical cases KEL-F fluorocarbon plastic offers a practical solution by providing a barrier between corrosive process stream and processing equipment.

Molded and fabricated valve linings, gaskets, ring seals, piping, and tubing of KEL-F plastic and laminated lined tanks, vessels, and reactors protect equipment against corrosion . . . prevent product contamination.

A UNIQUE PLASTIC

KEL-F plastic is virtually inert to all chemical attack—including mineral acids, oxidizing agents, and strong caustics. Its anti-adhesive property is an advantage in maintaining clean, unclogged lines and equipment.

A dense, tough thermoplastic, KEL-F plastic has outstanding physical properties: high compression strength, resistance to heat and cold, low moisture absorption. Supplied as a molding material, it can be readily molded by injection, transfer, or extrusion. Qualified fabricators are now producing piping and fittings, tubing, sheets, plastic laminates, rods and film of KEL-F plastic.

KEL-F Plastic Dispersions Available

Kellogg also supplies KEL-F plastic dispersions for coating equipment where size or construction makes molded plastic impractical. The resultant coating is tough and adherent—with all the outstanding properties of the molded plastic. If you do not maintain a coating department, we can put you in touch with experienced applicators.

Why not take up your specific corrosion problem with one of our chemical engineers. He'll show you how KEL-F Plastic or KEL-F Dispersions may be just the solution. Write us today.

Visit the Kellogg Booth #804, 901 Plastics Exposition—June 11-15 Coliseum, New York City

THE M. W. KELLOGG COMPANY

SUBSIDIARY OF PULLMAN INCORPORATED

Chemical Manufacturing Division
P. O. Box 469, Jersey City 3, N. J.

®KEL-F is the registered trademark of The M. W. Kellogg Company for its fluorocarbon products.

When inquiring check CP 5317 opposite last page

Excellent adhesion, resistance to chemicals furnished by floor coating . . .

can be applied in any film thickness from 10 mils to ½ inch

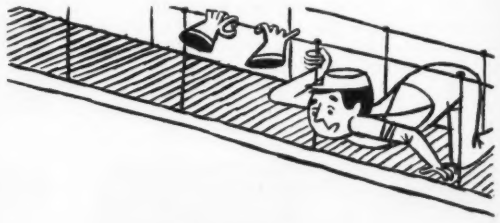
Uses: Although specifically developed for the maintenance of wood floors and walls of freight cars, material can be used as a floor coating in chemical plants and machine shop areas where storage of chemicals and oils is common.

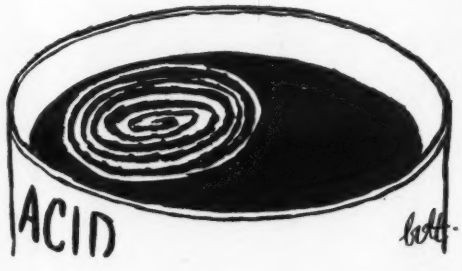
Features: Coating has excellent adhesion to wood, metal, and concrete. It is also highly resistant to chemicals.

Description: Since coating is a 100% resinous material, it can be applied in any film thickness — 10 mils to ½ inch or more. It contains no volatile solvents. Coating requires an organic peroxide as a catalyst for converting it to a hard, tough finish.

Coating can be applied by spray, brush, roller, or squeegee. Product possesses outstanding resistance to shock and impact, showing no adverse effects from extremely heavy weights and rough abuse caused by material handling lift trucks and other such mechanized equipment. Floor coating is skid-proof, even when wet with rain or snow. It may be supplied in a number of colors.

(Glid-Iron coating is product of The Glidden Company, Dept. CP, 10999 Madison Ave. Cleveland 2, Ohio. Check CP 5318 opposite last page.)





"Joe?"

Idea for this cartoon was sent to us by Francis K. Booth, an employe of Carbide Nuclear Co., Oak Ridge, Tenn.

☆

Every Article in CHEMICAL PROCESSING is "Staff Written"

Every article in CHEMICAL PROCESSING is terse, brief, to-the-point . . yet packed with essential facts of developments important to every man in chemical processing.

For every article is "Staff Written." Our Editors dig out the vital news-facts, then write them in the fewest possible words. That's why you read so much . . keep up with developments . . in short reading time. You don't have to "wade through" long, hard-to-read articles.

It's the most difficult kind of editing, but it pays big dividends to every busy reader.

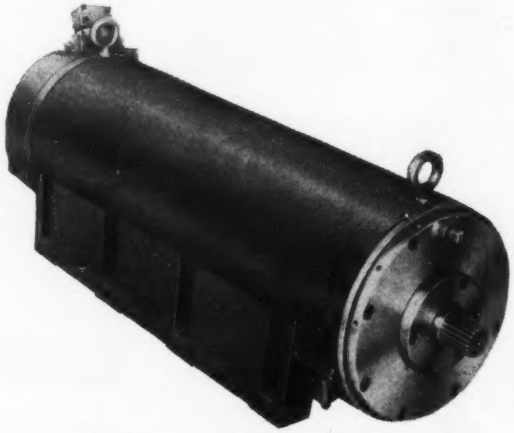
☆

Corrosive atmospheres can't hurt internal parts of motor . . .

entire unit enclosed in steel case filled with mineral oil

Uses: For use in chemical processing, cement processing, dry milling, and other similar applications where it is necessary to operate electric motors in explosive or corrosive atmospheres.

Features: Since entire motor is enclosed in a steel case filled with mineral oil of high dielectric strength, there is no opportunity for sparking



Sealed motor is suitable for applications involving moisture, dust, or hazardous conditions

or for corrosive attack on internal motor parts. Mineral oil also serves as a good natural lubricant for motor.

Description: Motor is designed for applications involving moisture, or hazardous conditions in mechanical drive applications. It is available in sizes from 20 to 450 hp. All motors come equipped with mechanical seals which replace standard packing in stuffing box.

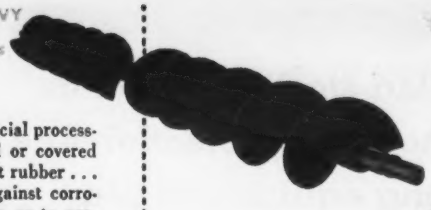
(BJ oil-filled motor is product of Byron Jackson Div., Borg-Warner Corp., Dept. CP, PO Box 2017A, Terminal Annex, Los Angeles 54, California. Check CP 5319 opposite last page.)

Chromium impregnation for corrosion protection

Four-page publication tells how metals can be given increased resistance to heat, wear, and corrosion through diffusion of chromium into the surface. Bul on chromium impregnation is issued by Chromalloy Corp., Dept. CP, 450 Tarrytown Road, White Plains, N.Y. When inquiring specify CP 5320 on form opposite last page.

NO SHAPE TOO SCREWY

for ACE Rubber Linings and Coverings



Most any size or shape of special processing equipment can be lined or covered with quality ACE hard or soft rubber . . . for meticulous protection against corrosion, to resist abrasive wear, or to provide electrical insulation. Ask for recommendations.

STOP VALVE CORROSION

at lower cost

There's an ACE hard rubber, rubber-lined, or plastic-lined valve for every corrosion application. Sizes from 2" to 24". Diaphragm, gate and check types. Free *Bulletin CE-52* lists chemicals that can be handled.

Take the guesswork out of CORROSION

No need for "trial and error" to find the right rubber or plastic chemical equipment. Consult American Hard Rubber Company first. Now eleven basic materials. Wide range of temperatures, pressures, strength. Backed by a century of experience. Write for facts today, or ask for name of Distributor.

FOR HIGH PRESSURES OR BIG PIPE LINES

ACE Rubber-Lined Steel . . . strength and pressures of steel plus chemical resistance of hard rubber. Excellent for alkalis, most inorganic acids, many organic acids, all salts, bleaches. Sizes 1¼" to 24" and up. *Bulletin CE-52.*

ACE-HIDE ACID PAIL

Practically indestructible

Its made of a new rubber-plastic material that's tough, resilient, suitable for handling most acids and alkalis. 3-gal. size. Easy-pour, drip-proof spout. Also 1-qt. and 2-qt. dippers, hard rubber bottles, etc. Write for name of nearest dealer.

ACE processing equipment of rubber and plastics

AMERICAN HARD RUBBER COMPANY

93 WORTH STREET • NEW YORK 13, N. Y.

When inquiring check CP 5321 opposite last page

Clad steel will give us the same protection and long equipment life as solid high alloy!
. . . at savings up to 50% in material costs!

Clad steel demonstration unit recently featured at the Nat'l Assoc. of Corrosion Engineers show.

LOOK AT THE RECORD!

SEE FOR YOURSELF!

ECONOMY—high-alloy layer assures corrosion resistance, long equipment life.
STRUCTURAL STABILITY—low-cost backing steel provides strength and rigidity.
DESIGN FREEDOM—integral bond allows design and fabrication of shapes to meet process and space needs.

. . . of growing applications of clad steel throughout the chemical and petrochemical industries.

In tanks, pressure vessels and other vital equipment, clad steel can be found wherever corrosion, abrasion or product contamination are problems. Why? Because economical clad steel delivers the benefits of solid high alloy . . . *at savings in material costs up to 50%!*

Add to this, clad's easy maintenance—very little stays long on those smooth, high alloy surfaces that a quick flush with water can't remove! The permanent, integral bond between cladding and backing steel eliminates seepage and crevice corrosion—makes modification simple. Walls can be cut, flanges or pipes welded on quickly and easily.

And only Lukens offers a selection of 16 cladding and 11 backing metals—giving you practically an unlimited selection of cladding and backing combinations to meet any conceivable need.

For more information consult your equipment builders or write to Manager, Marketing Service, Lukens Steel Company, 843 Lukens Building, Coatesville, Pennsylvania.

We'll show you in detail just why we say *clad steel is the ideal material for long range economy.*

LUKENS CLAD STEELS LUKENS

STAINLESS-CLAD • NICKEL-CLAD • INCONEL-CLAD • MONEL-CLAD

Producers of the Widest Range of Types and Sizes of Clad Steel Plates and Heads Available Anywhere

When inquiring check CP 5322 opposite last page

Preformed polyethylene jacket protects and insulates hot or cold lines . . .

resists abrasion damage, will not chip, flake, or corrode

Uses: Protection of hot or cold insulated lines.

Features: Jacketing resists damage from heavy blows such as would be caused by equipment and ladders. It will not chip, flake, or corrode.

Description: Pipe insulation jacketing is made of preformed polyethylene. It will not take the contours of wrapping material on wrapped lines. No painting is necessary, and it does not become brittle.

Polyethylene insulation jacketing is merely fitted around insulation, after which it springs shut by itself

Precut to 6′ lengths and preformed to correct diameters, jacketing is merely fitted around insulation, after which it springs shut by itself. Longitudinal seams are fastened with staples. Fittings are protected by coating with a special adhesive tape. One man can completely jacket more than 200 lineal feet of line in eight hours. Product provides a natural vapor barrier.

(Pip-Jac insulation jacketing is product of Dept. 38, Pip-Jac Company, Dept. CP, 295 Beverly Road, Pittsburgh 16, Pa. . . . or for more information check CP 5323 on form opposite last page.)

First successful fabrication of plastic salt dissolvers, brine storage tanks

Announcement is made of the first successful fabrication of plastic salt dissolvers and brine storage tanks. Glass-reinforced polyester plastic vessels do not corrode and need no paint. Since they are translucent, salt level is visible from any position around units.

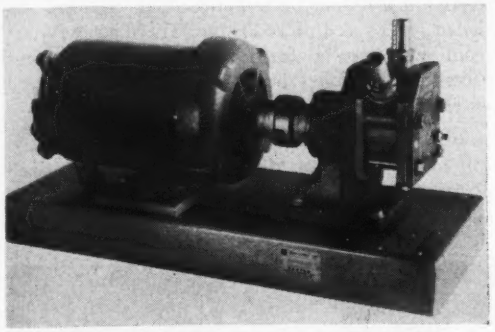
(For further information contact International Salt Co., Inc., Dept. CP, Scranton Life Bldg., Scranton, Pa. Check CP 5324 on form opposite last page.)

Self-priming stainless pumps have no stuffing box or mechanical seal . . .

suitable for handling corrosive solutions or abrasive slurries

Uses: For corrosive solutions, abrasive slurries, and fluids which must be maintained free from contamination.

Features: Pumps require no stuffing boxes or shaft seals of any sort, incorporating the Flex-i-liner principle of operation.



Pumps avoid the use of gaskets or check valves

Description: Pumps are self-priming and avoid the use of gaskets or check valves. They are available in ratings from 1/3 to 20 gpm.

(Flex-Alloy pumps are a product of Vanton Pump & Equipment Corp., Dept. CP, 201 Sweetland Ave., Hillside, N. J. . . . or for more information check CP 5325 on form opposite last page.)

Faster cutting, added safety, free flow, advantages of blast grit . . .

does not attract moisture, or rust, or pack in storage

Uses: In surface preparation operations.

Features: While cutting faster than other materials that have been available, material also flows freely and provides added safety since it is silicon-free.

Description: Material consists of a clean, sharp, hard angular grit. It does not attract moisture, rust, or pack in storage. It can be used over and over again.

(Black Beauty blast grit is product of H. B. Reed & Co., Dept. CP, 6618 Kennedy Ave., Hammond, Ind. . . . or for more information check CP 5326 on the convenient Reader Service slip which is located opposite last page.)

WE DON'T STOP WITH THE DELIVERY OF A CHEMICAL—

we put it to work and keep it working effectively

The chemical treatment of metals and metal parts—to prepare them for further processing, to protect them, to beautify them—has grown from a haphazard operation to a highly technical one. Supplying the chemical ingredients is a relatively simple job. Putting them to work and keeping them working effectively in your plant demands the skill of an experienced organization. We have that organization.

We supply not only the metal-treating chemicals, but also—free of charge—the technical and engineering service to keep them working at top efficiency. We furnish assistance in developing and installing the process, we maintain continuing inspection of the process and equipment if you so desire, we check samples of the processed metals in our Quality Control Laboratories—all these are part of the ACP service at your command.

That's why we say, "We don't stop with the delivery of a chemical—we put it to work and keep it working effectively." And we have been doing this for over 40 years. Write for a booklet describing ACP products and services.

Some of the many ACP processes and chemicals used in the treatment of metals

PAINT BONDING

Granodine® forms a phosphate coating base on iron and steel products—provides an excellent bond for paint, and greatly improves the corrosion resistance of the paint system.

Alodine® forms an amorphous film on aluminum which protects the metal and anchors the paint finish. Alodized aluminum meets service specifications.

Lithoform® promotes a good bond for paint on galvanized iron, zinc and cadmium plated surfaces. Also prevents any objectionable chemical reaction between applied paint film and the metal surface. One grade of Lithoform, in itself, provides excellent corrosion resistance on zinc and cadmium.

PROTECTION FOR FRICTION SURFACES

Thermoil-Granodine® forms a manganese iron phosphate surface which materially reduces wear and minimizes galling by eliminating metal-to-metal contact. It is particularly effective during break-in period of bearing surfaces.

RUSTPROOFING

Permadine®—a zinc phosphate coating chemical—forms a heavy oil-adsorptive crystalline coating on steel. Bonds paint or such rust-inhibiting oils as Granoleum®.

Thermoil-Granodine®—a manganese iron phosphate coating chemical—forms on steel a dense crystalline coating which, when oiled or painted inhibits corrosion.

IMPROVED DRAWING AND COLD FORMING

Granodraw® for steel, Granodraw SS for stainless, and Alodine® for aluminum for an integral coating with the base metal which facilitates the cold mechanical deformation of the metal, improves drawing characteristics and lengthens die life.

A pioneer in the development and servicing of metal treatment processes

AMERICAN CHEMICAL PAINT COMPANY Ambler 32, Pa.

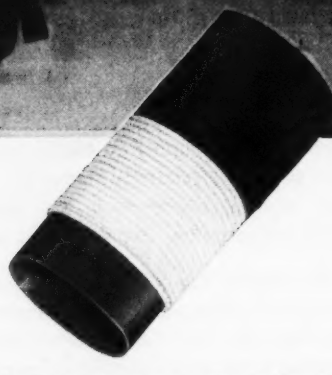
DETROIT, MICHIGAN NILES, CALIFORNIA

WINDSOR, ONTARIO

CHEMICALS ACP PROCESSES

When inquiring check CP 5327 opposite last page

Here's why this PETROCHEM fire hose is on guard throughout this D-X Sunray refinery



Get acquainted with your Quaker-Quaker Pioneer distributor. You'll find him of real help—not only for your regular needs — but also in emergency situations requiring extra fast supply. Write for free brochure and name of your nearest distributor.

This hose does *more* than fight fire. It fights off deterioration by oil and chemicals, stands up to abrasion, resists weather and functions safely under high pressure. Why? Because its oil-resistant Neoprene tube is enclosed in tough, wear-defying *Du Pont Dacron* impregnated with oil-proof Neoprene . . . this provides a tough, light, flexible hose, resistant to oil, both inside and out. Actually this hose is so strong that it can take pressures up to 500 lbs. and temperatures up to 300°F. . . . and so flexible that you can actually knot it. Easy to store, too! Either coiled or folded it takes little space.

These are some of the reasons why D-X Sunray's Oklahoma refinery has this hose . . . the first made for oil and chemical industries, at all fire stations . . . and why it will pay you to consider it in your safety planning. Complete Quaker-Quaker Pioneer line includes hose for every purpose, belting, packing and moulded rubber for every use.

DIVISIONS OF HKP H. K. PORTER COMPANY, INC.

H. K. PORTER COMPANY, INC.
QUAKER RUBBER DIVISION
Philadelphia 24, Pa.
QUAKER PIONEER RUBBER DIVISION
San Francisco 7, California

When inquiring check CP 5328 opposite last page

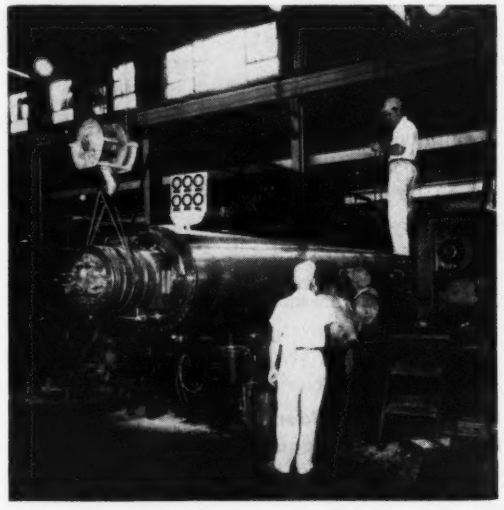
Alloy eliminates maintenance on suction press rolls at Union Bag & Paper . . .

Monel rolls have operated for over three years without reaming and refinishing

Problem: Suction press rolls formerly used at Union Bag and Paper Company's Savannah, Georgia Kraft paper plant needed reaming and refinishing every three months. Corrosion, buildup of fibers, and chemicals plugging suction holes forced periodic shutdowns. In order to keep lost time to a minimum, spare rolls were held in stock.

Rolls are installed on a Fourdrinier machine, designed for a speed of 2000 fpm. They squeeze water from wet, newly formed paper sheet, against pressure of another heavy roll. Pressure is aided by suction.

Solution: In 1953, mill installed a suction press roll fabricated from Monel. Three two-inch thick plates were cold press formed into 120° sections and longitudinally welded to form roll. Completed



Nickel-copper alloy suction press roll being installed at Savannah, Georgia Kraft paper plant

roll is 240" long, 36" in diameter, and weighs 23,500 lb. It was drilled with thousands of holes to allow suction to be applied.

Results: Rolls have not needed reaming or surface refinishing in three years since installation. Extra rolls are not needed and downtime has been eliminated. Higher modulus of elasticity of alloy allows safe operation at higher nip pressure as well as more open area for increased suction efficiency.

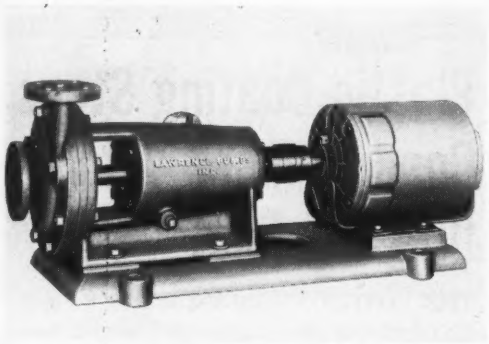
(Monel is supplied by International Nickel Co., Inc., Dept. CP, 67 Wall St., New York 5, N.Y. . . . or for more information check CP 5329 on the convenient Reader Service slip which is located opposite last page.)

Wetted parts of midget pump are stainless steel . . .

units can also be obtained in Hastelloy and in plastics

Uses: For application in the chemical and process industries.

Features: All wetted parts are made of stainless steel and are particularly resistant to corrosive solutions. Pumps are also available in other alloys such as Hastelloy and in plastics.



Handles corrosives at rate of 5 to 40 gpm

Description: All bearings are prelubricated. Packing boxes are eliminated and replaced with externally adjusted mechanical seals. Units have extra heavy shaft and bearings, and non-clogging impeller. Capacities range from 5 to 40 gpm and heads from 25 to 160'.

(Midget pumps are product of Lawrence Pumps Inc., Dept. CP, 371 Market St., Lawrence, Mass. Check CP 5330 on form opposite last page.)

Corrosion-resistant pipe dope prevents seizure . . .

Teflon-based product acts as vapor barrier, reducing galvanic corrosion

Uses: For threaded pipe and fitting assemblies used with corrosive and difficult-to-hold liquids.

Features: Product has unusual powers in minimizing seizure or galling. It also acts as a protective barrier, reducing galvanic corrosion.

Description: Teflon-based pipe dope makes it easier to use stainless steels and similar alloys which have marked tendencies to seize and gall in service. Use of the product permits the economical reuse of expensive alloy valves and fittings.

(T-Film Teflon-based pipe dope is product of Eco Engineering Co., Dept. CP, 12 New York Ave., Newark 1, N.J. Check CP 5331 opposite last page.)

Corrosioneering News

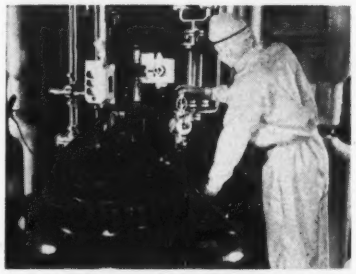
Quick facts about the services and equipment Pfaudler offers to help you reduce corrosion and processing cost.

Published by The Pfaudler Co., Rochester, N.Y.

How to protect color and purity of plasticizers during polymerization

Color and purity are the prima donnas of the polymerization process.

Contamination can spoil both. To avoid it, you need equipment that is easy to clean between each run, that resists the corrosive action of the chemicals involved, and that does not put metal in contact with your product.



This type of glassed steel kettle, used in the manufacture of polyester resin, helps protect product from contamination.

That's why Pfaudler glassed steel reactors have found universal application as polymerization vessels.

Practically nothing sticks to their glassed interior. They wash clean quickly and easily between runs, avoiding contamination of succeeding batches.

Resisting all acids (except hydrofluoric) and alkaline solutions up to pH 12 and 212° F., Pfaudler acid-alkali-resisting glassed steel protects your product from contamination and protects your equipment investment from excessive replacement needs.

Full year's guarantee against corrosion

In fact – the corrosion resistance of Pfaudler glassed steel is so well documented that we offer a full year's guarantee against corrosion destruction, under the conditions for which the vessel is sold. 12 months of 100% freedom from corrosion, even if you process 24 hours a day!

Nonmetallic

Contamination by metals – particularly iron – can cause discoloration of your product. You get the tremendous strength of steel, but not the ferric contamination, when you use glassed steel. The glass is permanently bonded. It doesn't peel or flake off.

Write or call for additional details.

Hundreds of stainless steel dimples cut kettle costs as much as 20%

If you need a jacketed stainless steel reaction kettle – for nonpressure use, or for high pressures – you can cut up to 20% off its initial cost with the Pfaudler dimpled jacket design.

This exclusive design permits the use of a lighter gauge metal in the jacket, yet strengthens the metal to the point where it is as strong as, or even stronger than a nondimpled, heavier jacket would be.

The dimples are hundreds of indentations with reinforced welds, and they are obtainable in low-cost *standard* reactors from 750 to 2000 gallons.

Specially built dimpled jacketed reactors, like this one, have been fabricated as large as 7,000 gallons.

Jackets may be either carbon or stainless steel.

You get greatest savings on reactors requiring a jacket pressure of 150 psi, but even when you only plan to use 50 psi, the Pfaudler dimpled jacket uses less material and costs less than conventional jacketing.

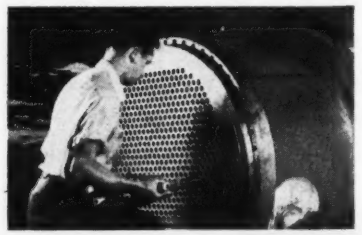
Besides the standard designs up to 2,000 gallons, you can also enjoy the benefits of this dimpled construction in special custom reactors built to meet your special needs.

The National Board of Boiler and Pressure Vessel Inspectors have approved this construction for 150 psi jacket pressure, and we can supply vessels bearing the code stamp.

Heating and cooling is as fast as with conventional jackets, and in many cases has proven faster.

If heat treating is desired, Pfaudler has complete facilities to heat treat stainless steel jackets of this dimpled type, giving you exceptionally long-lasting equipment.

Low-priced heat exchanger has 8 valuable virtues



An electronically controlled roller expander locks the tubes in position in the tube sheet during careful fabrication at Pfaudler.

Pfaudler fixed tube sheet heat exchanger is simple in design, hence costs you less than other types.

Fabricated from stainless steel or alloys, it gives you a number of advantages. Here are eight:

1. Versatility—Most widely used type of heat exchanger in the chemical industry. Used as a heater, cooler or condenser.

2. Easy cleaning – Tubes are straight and you clean them easily by simply removing the heads. Shell side may be flushed with chemical solutions.

3. Low cost—Because of large quantity production, standardized design, and use of full tube bundles, prices of fixed tube type heat exchangers are the lowest per square foot of any heat exchanger.

4. Fast delivery – A large number of Pfaudler fixed tube sheet stainless heat exchangers are maintained in stock, and you can often get delivery within one week when required.

5. Replacement of parts – Pfaudler carries a complete line of standard heat exchanger parts in stock and shipment may be made on short notice.

6. No intermix – The tube sheets are welded to the shell. Therefore, there is no possibility of tube side fluid mixing with shell side fluid since there are no internal gaskets.

7. Expansion diaphragm – When necessary, an expansion diaphragm may be installed to take care of differential expansion between the shell and tube side.

8. No leakage – By means of an electronically controlled torque tube expander, leakproof joints are obtained between tubes and tube sheets. Further insurance against leakage may be obtained by using double tube sheets, or seal welding the tubes to tube sheets when so desired.

When inquiring check CP 5332 opposite last page

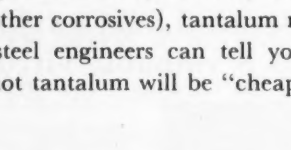
TANTALUM... We recommend it only when it is the cheapest material AVAILABLE

Tantalum is seldom cheaper on a "per-pound" basis. But tantalum is quite often the "cheapest" material when judged on an over-all final operating cost basis, on a product purity basis, on a freedom from maintenance or an elimination of down-time basis.

We don't expect anyone to take tantalum on faith or generalities. But if you process hydrochloric acid, nitric acid, perchloric acid, bromine, iodine, hydrogen peroxide, sulfuric acid, chlorine, chlorine dioxide (and many other corrosives), tantalum may save you money. Fansteel engineers can tell you, definitely, whether or not tantalum will be "cheapest" for you.

USE TANTALUM WITH ECONOMY for most acid solutions and corrosive gases or vapors.

Not recommended for HF, strong alkalis or substances containing free SO_3.



Write for free TANTALUM booklet today!

FANSTEEL METALLURGICAL CORPORATION
Chemical Equipment Division
NORTH CHICAGO, ILLINOIS, U.S.A.

G563A

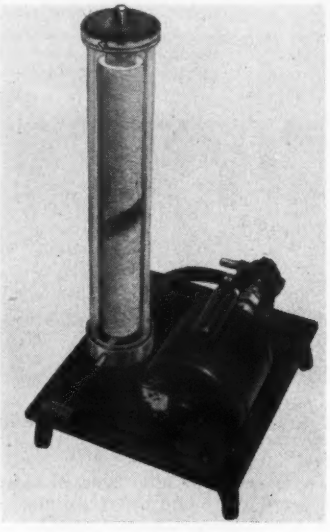
When inquiring check CP 5333 opposite last page

Self-priming unit filters majority of corrosives . . .

recent model has capacity of 200-300 gph

Uses: For removal of particles from 1 to 150 microns in corrosive solutions.

Features: Filter pump will resist most corrosive solutions.



Removes particles from 1 to 150 microns

Description: Self-priming filter pump is rated at 200-300 gph capacity. Unit has a separate seal plate for filter tube as well as a cover for sealing outer shell of filter assembly.

(Model LSIN-20 filter pump is product of Sethco Mfg. Co., Dept. CP, 70-78 Willoughby St., Brooklyn 1, N.Y. Check CP 5334 on form opposite last page.)

Highest-priced paint in the world . . .

possesses unusual resistance to corrosion

Announcement is made of what is believed to be the highest-priced paint in the world. Product, known as Fluoro-B has unusual corrosion resistance, being able to withstand

Plastic Coating Stops Costly Condensation Drip and Rust

THE COSTLY PROBLEM caused by dripping from this sweating pipe was permanently solved with one easy and inexpensive application of NoDrip Plastic Coating. Sweating pipes, ceilings, air ducts and other metal equipment are also completely protected against rust and corrosion by low cost NoDrip.

NoDrip Plastic Coating acts immediately to insulate and protect. One application adds many years of service life to metal equipment. NoDrip is also resistant to acid, alkali and brine...protects concrete, brick, plaster, tile wood or composition surfaces.

Easy application requires no special equipment or skill. Anyone can apply NoDrip with brush, trowel or spray. Stop your condensation problem now! Get full details without delay.

JW Mortell COMPANY

FREE

32-PAGE NoDrip DATA HANDBOOK
Complete with photographs, charts and technical information to solve your condensation problem. Write today.
Available at leading plumbing and mill supply houses

J. W. MORTELL CO., 530-E Burch St., Kankakee, Ill.
Please send my FREE copy of the NoDrip Data Handbook.

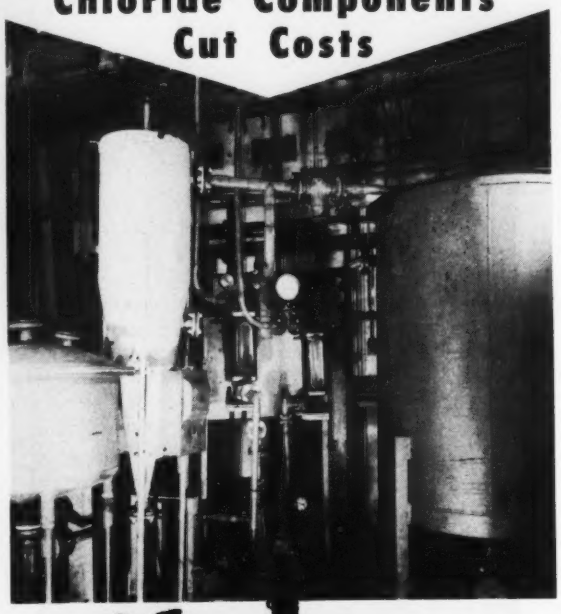
Name_____

Company_____ Title_____

City_____ Zone____ State_____

When inquiring check CP 5335 opposite last page

AGILE Corrosion-Resistant Polyethylene And Polyvinyl Chloride Components Cut Costs

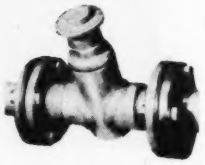


Ventilating Ducts

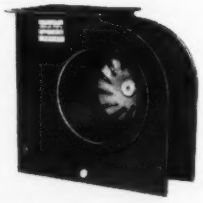
Horizons, Inc. Benefits From Anti-Corrosive Agilide Tank, Pipe And Valves

For Horizons, Inc., leading independent research organization, the use of a corrosion-resistant polyvinyl chloride processing tank, plus flanged pipe and valves in a small pilot plant laboratory has made possible trouble free handling of highly corrosive acids, alkalis, solids and liquids. Original costs were less, maintenance is negligible, and there is no contamination.

Where corrosion and contamination are problems, polyethylene and polyvinyl chloride piping, valves, ventilating ducts or exhaust fans are sure to provide a most practical and economical answer.



Flanged Valves



Ventilating Fan

You can benefit from these features:

- Lighter Weight
- Easier Installation
- Longer Service Life
- Lower Initial Cost, Negligible Maintenance
- Greater Rigidity and Strength

Write For Our Free Catalog, AA-2

AGILENE AGILIDE

AMERICAN AGILE Corp.

Plant and General Offices • 5461 Dunham Rd. • Maple Heights, O.
Mailing Address, P. O. Box 168 • Bedford, O.

When inquiring check CP 5336 opposite last page

fuming nitric acid, concentrated sulfuric, concentrated hydrochloric, and concentrated hydrofluoric acid. In spite of its high price, coating will afford economies in applications which cannot be withstood by other materials.

(Fluoro-B is product of Lankote Div., J. Landau Co., Dept. CP, Carlstadt, N.J. When inquiring specify CP 5337 opp. last page.)

Protects concrete, asphalt, or macadam . . .

coating suitable for floors or roofs

Uses: For protecting macadam, concrete, asphalt, or blacktop surfaces. It is suitable for floors, roofs, or other surfaces.

Features: Coating forms a protective film which resists atmospheric acids, smoke, fumes, water, gasoline, oil, salt spray, and alkalis. It is suitable for areas that are usually wet.

Description: Coating is a pitch-base bituminous resin of liquid consistency. It can be applied over damp surfaces and comes complete, ready to use. It may be brushed on or sprayed. It produces a dry film that is not slippery, even when wet.

(Stontreet coating is product of Stonhard Co., Dept. CP, 1306 Spring Garden St., Philadelphia 23, Pa. Check CP 5338 on form opposite last page.)

Handling cutting fluids for stainless steel

Four-page bulletin covers the pumping of cutting fluids used for machining of stainless steel. Pump described uses a Bakelite body block and Hycar liner.

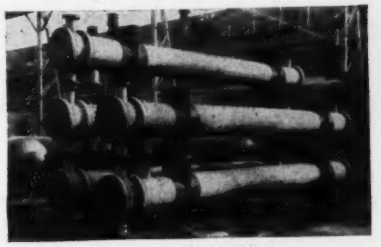
Bulletin on handling cutting fluids is issued by Vanton Pump & Equipment Corp., Div. of Cooper Alloy Corp., Dept. CP, 201 Sweetland Ave., Hillside, N.J. When inquiring specify CP 5339 opposite last page.

Stainless steel plus nickel alloy equals corrosion-resistance

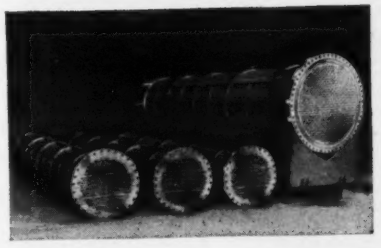
Inconel and stainless heat exchanger built for Barrett Division, Allied Chemical & Dye Corporation. Shell Diameter: 30". Tube Length: 12' 0". Tubes: 1" O.D. x 14 ga. Tube Sheet Thickness: 2". Materials: Inconel shell, tubes, tube sheets. Stainless steel heads, Type 316L.

Corrosion-resistant materials a heat exchanger specialty at Downingtown

We have the engineering, welding and fabricating experience to turn out your corrosion-resistant exchangers in the materials you specify: stainless, nickel, nickel alloy, aluminum bronze, carbon and many others. Our design recommendations often save money. Send for Bulletin HE. Your engineers will find it useful.



Aluminum bronze for these five coolers saved the customer 25% on equipment costs, assured corrosion resistance. Each fixed tube sheet unit is 20" in diameter x 20' tube length. Each has 282 aluminum bronze tubes ¾" O.D. x 12 ga. Centrifugally cast channels. Design pressure: 150 pounds per square inch on both shell and tube sides.



Stainless steel Type 304 is the material for these four tube bundles. The large one fits a 37" shell, has 1225 stainless tubes, ¾" O.D. x 14' 0" long. Tube sheet: 2⅞" thick. Baffles: 3/16" thick. The other three bundles are 22" in diameter; each contains 352 tubes ¾" O.D. x 16 ga. x 12' 0" long. Tube sheets: 1¾" thick. Baffles: ¼" thick. All stainless steel.

Downingtown Iron Works, Inc.

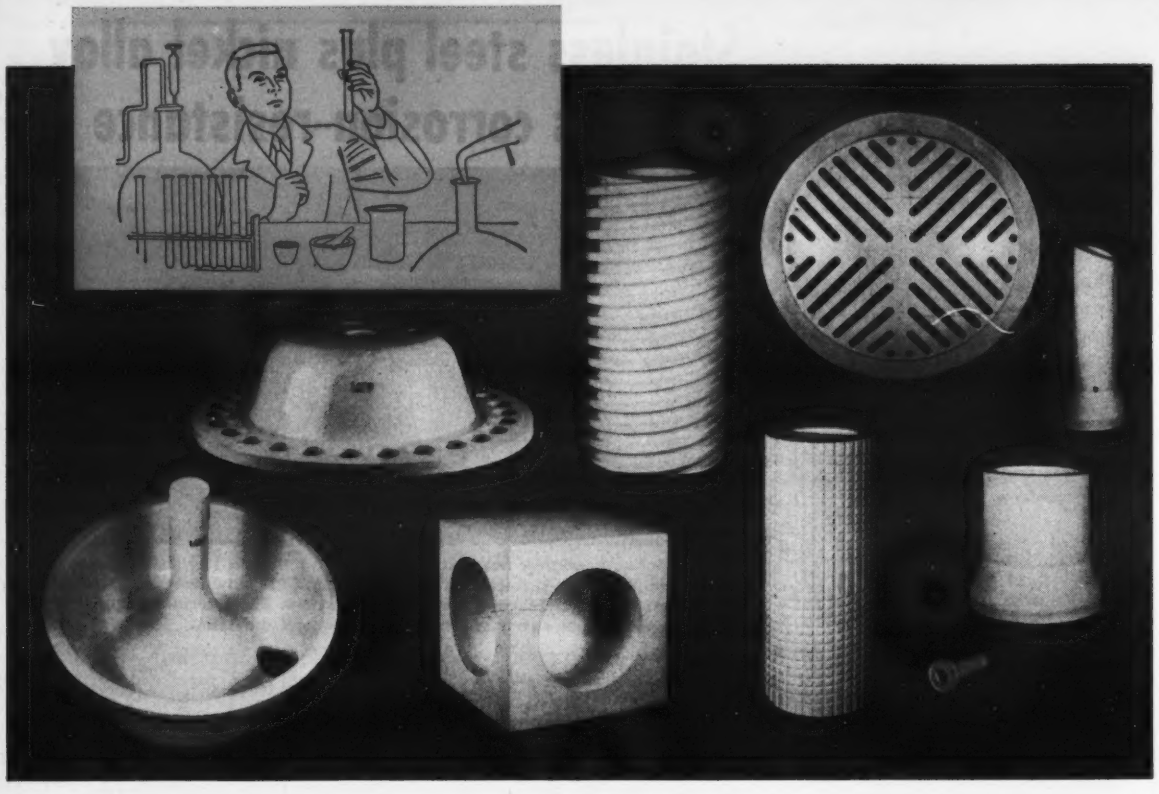
HEAT EXCHANGERS—STEEL AND ALLOY PLATE FABRICATION

144 Wallace Ave., Downingtown, Pennsylvania—Branch Offices:
52 Vanderbilt Ave., Rm. 2087, New York 17 • 235 Hanna Bldg., Cleveland 15, Ohio
936 W. Peachtree St., N.W., Rm. 126, Atlanta 3 • 208 S. LaSalle St., Rm. 796, Chicago 4
568 Roosevelt Bldg., Los Angeles 17 • 4550 Main St., Rm. 210, Kansas City 6, Mo.
Division of Pressed Steel Tank Company, 1463 S. 66th St., Milwaukee 14, Wis.

DOWNINGTOWN IRON WORKS Hackney

CONTAINERS AND PRESSURE VESSELS FOR GASES, LIQUIDS AND SOLIDS

When inquiring check CP 5340 opposite last page



ADD LABORATORY PURITY TO YOUR PROCESS WORK

WITH LAPP CHEMICAL PORCELAIN

Don't sacrifice purity when putting a new process into production. There's no reason to search for substitute materials that *might* duplicate laboratory results . . . use the *same* materials in which the laboratory worked out the process. That's right! Porcelain, the world-wide standard for laboratory purity, is available in Lapp Chemical Porcelain equipment for pilot plant *and* industrial production. A wide variety of valve styles, pipe and fittings, towers and raschig rings and many special shapes, including custom pieces for your specific requirements, are available, and at costs much less initially than many types of special alloy or lined equipment. Lapp Porcelain is chemically inert, hence corrosion resistant—it usually requires no maintenance.

Where extreme care must be given to protection of product, plant or personnel against accident or carelessness, specify Lapp Chemical Porcelain with TUFCLAD Armor. TUFCLAD (multiple layers of heavy fiberglass fabric bonded with an Epoxy resin) serves as protection against impact, insulation against thermal shock, and is strong enough to hold line pressures even when porcelain is cracked or broken.

Lapp
CHEMICAL
PORCELAIN

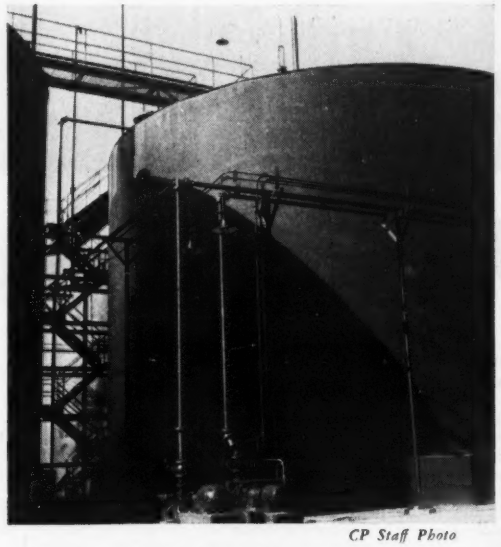
WRITE *for bulletin describing the characteristics of Lapp Chemical Porcelain. Lapp Insulator Company, Inc., Process Equipment Division, 815 Wendell St., Le Roy, New York.*

When inquiring check CP 5341 opposite last page

Vinyl coating prevents tank corrosion at Stauffer Chemical

Protects against sulfur dust, steam and sulfuric acid fumes

Problem: Acid storage area at Stauffer Chemical Company's Hammond, Indiana, plant is subjected to sulfuric acid, sulfur dioxide, sulfur trioxide, and oleum fumes as well as steam and sulfur dust. Metal storage tanks and walkways, if unprotected, would be seriously attacked by this corrosive combination of air-borne particles.



CP Staff Photo

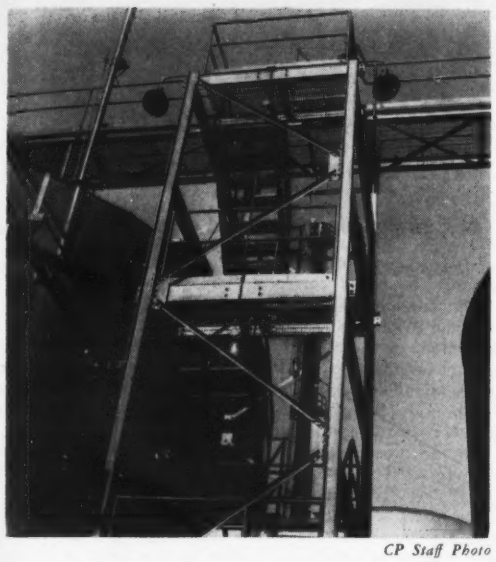
Coating on tank is in excellent condition after more than a year of exposure to corrosive fumes

Solution: In October of 1953 Stauffer applied a protective vinyl maintenance coating to outside surface of two tanks 30 ft in diameter and 28 ft high. One tank contains oleum and one 78% sulfuric acid. Two coats were applied over a primed surface.

Same vinyl coating was applied in the fall of 1954 to three additional tanks and auxiliary structures in three coats over a sandblasted surface. Tanks are 48 ft in diameter, 30 ft high, and contain 75% sulfuric acid.

In the summer of 1955 an additional tank was protected by three coats of the vinyl over sandblasted steel. This tank is 25 ft in diameter, 28 ft high with a conical bottom. It holds 78% sulfuric acid.

No thinner is required for vinyl coating which dries by evaporation of volatile solvents, without



CP Staff Photo

Tank and stairwell were coated in fall of 1954

oxidation or baking. Average film thickness was six mils.

Results: Tanks and other structures have required no maintenance, since coated, despite exposure to corrosives. Coatings are in good condition.

(No. 33 vinyl maintenance coating is a product of Amercoat Corp., Dept. CP, 4809 Firestone Blvd., South Gate, Calif. . . . or for more information check CP 5342 on form opposite last page.)

at the 7th National Plastics Show!

Vinyl tells an exciting story about the future of your product at the Firestone Exon Booth No. 831-835.

In this exhibit of Exon, industry's most complete source of vinyl resins, you will discover how many new ways vinyl will enrich your product —and your profit picture.

Of very special note is a new and highly promising use of that remarkable plastisol resin, Exon 654. The new development, VINYLFOAM, has been proved outstanding in cushioning, safety, utility and economy.

This is new and dramatic evidence of the plastics industry's limitless opportunities, particularly in vinyl.

We expect Exon 654, with all its exceptional properties, to play a major role in its advancement . . . as all Exon resins are contributing to the growing significance of plastic in industrial and consumer life.

We invite you to be our guest.

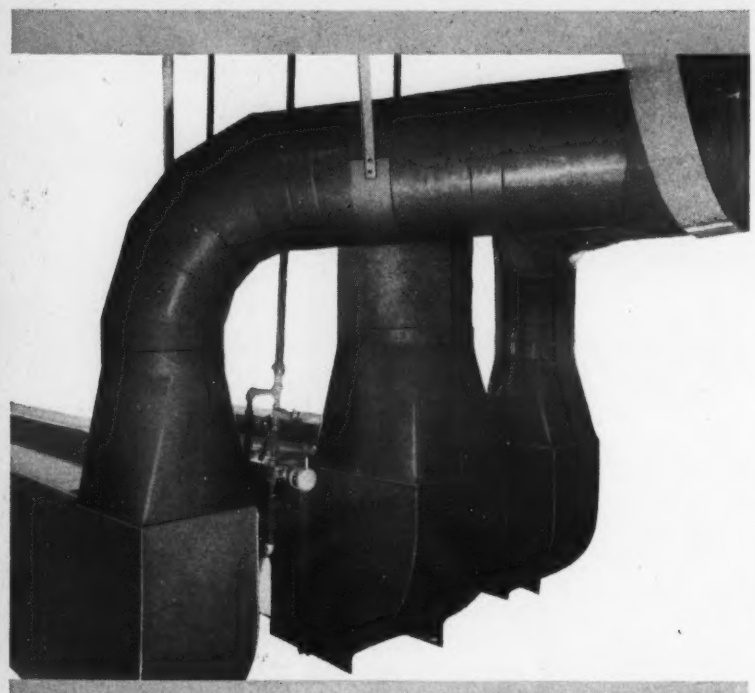
Firestone

EXON.

.... CHEMICAL SALES DIVISION
FIRESTONE PLASTICS COMPANY, POTTSTOWN, PA.
DIVISION OF THE FIRESTONE TIRE & RUBBER CO.

When inquiring check CP 5343 opposite last page

anodizing fume corrosion stopped



by KAYKOR VYFLEX® F-92 PVC

A large midwestern manufacturer of aluminum parts for household appliances was having corrosion troubles. All efforts to keep a fume exhaust system in service over the anodizing tanks failed . . . until he discovered F-92 structural PVC. In a typical application of this tough, resistant material, his 25′ anodizing tanks were equipped with F-92 hoods, which vented fumes to 24″ and 32″ stacks of the same material.

Sulfuric acid splash and fume from the anodizing tanks can't harm the new exhaust system because it's completely fabricated of unplasticized Polyvinyl Chloride . . . even to the nuts and bolts. Inert to the widest range of corrosive processing agents, at temperatures to 165F, this Kaykor material also offers such attractive physical properties as high tensile and flexural strength, hardness, abrasion resistance, and electrical and thermal insulation properties.

Well equipped, highly experienced Kaykor fabricators across the country stand ready to solve *your* corrosion problems with standard or custom designed equipment and parts of VYFLEX F-92 PVC.

GET THE FACTS! Write for complete information in new Bulletin "F-92", available free on request to Kaykor Industries, Inc., 4401 Broad St., Yardville, New Jersey, or ask your local Kaykor fabricator.

KAYKOR INDUSTRIES INC.
Division of Kaye-Tex Manufacturing Corp.
YARDVILLE, NEW JERSEY

When inquiring check CP 5344 opposite last page

Corrosionomics tells of tantalum

Corrosionomics, a four-page publication, tells how corrosion problems have been solved through the use of tantalum. Two case histories illustrate how tantalum was used to advantage in specific chemical plants. Available literature on the metal, along with other information, is given.

"Corrosionomics" is issued by Fansteel Metallurgical Corp., Dept. CP, North Chicago, Ill. Specify CP 5345 opp. last page.

Stops rust action, prepares metal for paint . . .

coating subsequently applied adheres tightly

Uses: To prepare metal for painting.

Features: While preparing metal, compound stops rust action. Paint subsequently applied adheres tightly so that moisture cannot penetrate to the metal.

Description: Product is a balanced formula of phosphoric acid and dichromate with extenders and wetting agents. It can be applied by brush or spray.

(Ospho for metal treatment is available from Rusticide Products Co., Dept. CP, 3125 Perkins Ave., Cleveland 14, Ohio. Check CP 5346 on form opposite last page.)

Data on glassed-steel trailer tank

Glassed-steel trailer tank is described in two-page data sheet. Trailer tank is inert, non-contaminating, easy to clean, and tough. It is guaranteed against corrosion.

Data sheet 29 is issued by The Pfaudler Co., Dept. CP, 1000 West Ave., Rochester 3, N.Y. Check CP 5347 opp. last page.

Efficient — h = 260 BTU/hr./ft.²/Deg. F.

Cools corrosive fluids with **complete** protection

PYREX brand glass shell and tube heat exchanger

Here's a new way to safely cool, condense, partially condense, exchange or reflux corrosive fluids and fluids sensitive to metallic contamination.

It's the PYREX brand glass shell and tube heat exchanger. In this unique new unit, fluids contact only glass, chemically resistant ceramic and Teflon. It brings you relief from fouling, corrosion and contamination. You can use either the shell side or tube side for all fluids except HF or hot concentrated phosphoric acids and alkalis.

You can choose from two capacities: 13½ and 50 sq. ft. Both are compact. The 50 sq. ft. unit, for example, requires only 9″ x 13′6″ floor space, 13″ height and weighs just 165 lbs.

For complete details that show how the PYREX brand glass shell and tube heat exchanger can simplify your corrosive fluids processing, circle the reader service form at the back of this publication.

CORNING GLASS WORKS
Corning, New York
Corning means research in Glass

When inquiring check CP 5348 opposite last page

LOOK TO ATLAS FOR CORROSION PROTECTION

CORROSION - PROOF CEMENTS

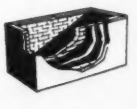
Atlas manufactures a complete line of corrosion proof cements, each designed to do a particular job. The choice involves a thorough study of conditions and materials being handled.

PROTECTIVE COATINGS

A protective coating to solve your specific problem. The recommendation of a coating most suitable for customer conditions is a regular Atlas service.

CORROSION PROOF LININGS

There is an Atlas tank lining to solve your corrosion problem. Atlas linings are based on the highest quality manufactured materials available. Installed at an Atlas plant or in the field.



Write for Bulletin CC#3 for complete information on the Atlas line.

ATLAS MINERAL
MERTZTOWN, PENNSYLVANIA

When inquiring check CP 5349 opposite last page

Zinc metallizing permits shipment of solvents without discoloration or contamination . . .

method has also been used for tanks for storage of glycerine

Metallizing with zinc is playing an increasingly important role in the shipment of caustic soda, ethylene glycol, carbon tetrachloride, ethylene dichloride, propylene glycol, and other products by tankers. Tanks on vessels metallized in this way are still in good condition after several years

Periodic inspections of this vessel, whose tanks were metallized with zinc to protect its bulk liquid chemical cargoes, show that it is still in good condition after six years service

service. Solvents and other products can be handled in vessels treated in this manner without discoloration or contamination.

Tankers that are treated in this way are first cleaned thoroughly by sand blasting. Zinc is then sprayed on surface to a minimum thickness of .008". Ventilating fans are used while work is in progress.

During the summer of 1955 two large storage tanks, 60' in diameter by 36' high, were sprayed with zinc in this manner at an Eastern terminal located near New York. These tanks are used for the storage of glycerine. A zinc-sprayed tanker will be used to haul glycerine from Texas to the Eastern terminal.

(Sprayed zinc coatings were applied by Metalweld, Inc., Dept. CP, Scotts Lane & Abbottsford Ave., Philadelphia 29, Pa. Check CP 5350 opp. last page.)

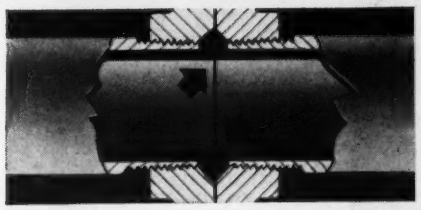
Describes leakproof chemical pump

Four-page bulletin describes series of chemical pumps which eliminate leakage of the fluid being handled. Units have no seals or stuffing boxes. Pumps can handle corrosives at temperatures up to 450°F and can withstand pressures to 150 psi.

Bul 1050 is issued by Chempump Corporation, Dept. CP, 1300 E. Mermaid Lane, Philadelphia 18, Pa. Specify CP 5351 opposite last page.

DOW

You can see why Saran Lined Pipe prevents corrosion



Liquid never touches metal in Saran Lined Pipe even at a flanged connection like this.

Acids, alkalis and other corrosive liquids never touch the rigid steel pipe . . . it's continuously lined with durable, corrosion-resistant saran

Say good-by to corrosion problems when you install saran lined pipe, fittings, and valves. This combination of corrosion-resistant saran swaged into rigid, non-bursting steel has a proved record of corrosion prevention in the chemical, petroleum, waste, pulp and paper, metal finishing and food processing field.

Saran lined pipe, fittings and valves form tight, snug, leakproof joints . . . is available for working pressures up to 150 psi. Fittings and valves are also available in steel for working pressures to 300 psi. You'll be amazed how easy and economical it is to install this modern piping, too. For it can be cut and threaded in the field with available pipe fitters' tools. And because it's rigid, a minimum of supporting structures are needed.

For further information on saran lined pipe, fittings, and valves send in the coupon on the right today. THE DOW CHEMICAL COMPANY, Midland, Michigan.

Saran Lined Pipe Company
2415 Burdette Avenue
Ferndale, Michigan
Dept. SP627B
Please send me information on saran lined pipe, valves, and fittings.

Name_____ Title_____

Company_____

Address_____

City_____ State_____

Saran Lined Pipe is Manufactured by The Dow Chemical Company, Midland, Michigan

you can depend on DOW PLASTICS DOW

When inquiring check CP 5352 opposite last page

Describes neoprene coating for corrosives

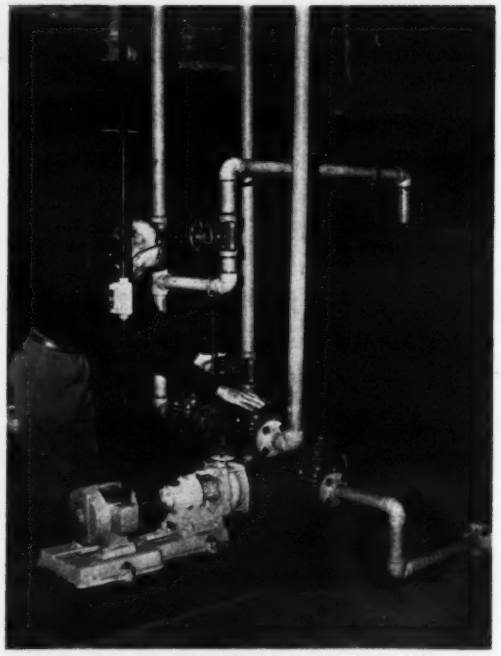
Economical single-package synthetic rubber coating for use in corrosive atmospheres is described in four-page bulletin. Abrasion resistance, weathering properties, ease of application, and other information on the coating is given.

Bul 701 is issued by Carboline Co., Dept. CP, 331 Thornton Ave., St. Louis 19, Mo. When inquiring specify CP 5354 on form opposite last page.

Chromic acid recovery system makes extensive use of PVC piping . . .

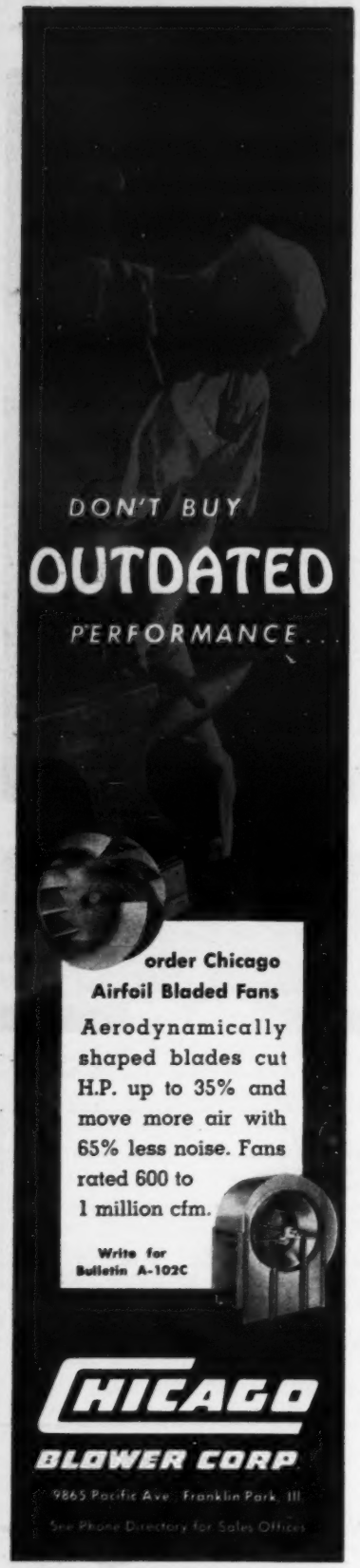
prevents contamination and leaks, needs no painting

Piping system made from unplasticized polyvinyl chloride is an important part of the new $50,000 chromic acid recovery and solution purification facilities of Perfect Circle Corporation, Hagerstown, Indiana. Among the outstanding advantages found for the plastic piping are prevention of contamination and leaks and the elimination of the necessity for painting.



These 2" lines of polyvinyl chloride serve the chromic acid dilution tank at Perfect Circle

PVC piping is used in five different applications in the plant. In the first application lines employed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OUTDATED
PERFORMANCE...
order Chicago
Airfoil Bladed Fans
Aerodynamically shaped blades cut H.P. up to 35% and move more air with 65% less noise. Fans rated 600 to 1 million cfm.
Write for Bulletin A-102C
CHICAGO
BLOWER CORP
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See Phone Directory for Sales Offices

When inquiring check CP 5353 opposite last page

There's Nothing Like it!
New COBRA K-90
Seamless, Flexible METAL HOSE
Made from 99% LOW CARBON NICKEL
...ANSWERS INDUSTRY'S PROBLEM OF FLEXIBLE HOSE
THAT WILL... 1. Stand Up Under Temperatures Up to 2000° F.
2. Carry Corrosive Gases.
3. Absorb Differential Expansion and Vibration.
Now, COBRA K-90, the ONLY seamless flexible hose made from 99% LOW CARBON NICKEL, is another outstanding member of the complete COBRA METAL HOSE line... serving industry with all sizes of hose made of bronze, stainless or carbon steel, monel, inconel.
COBRA SOLICITS YOUR INQUIRY FOR FREE QUOTATION
WRITE TODAY FOR ILLUSTRATED CATALOG
COBRA METAL HOSE DIVISION · DK MFG. CO. 4640 W. 54th Street Chicago 32, Illinois

When inquiring check CP 5355 opposite last page

FOR HIGH TEMPERATURE — HIGH PRESSURE SEALING

DURA SEAL TYPE P.T. is the engineered mechanical seal for meeting severe sealing conditions. Pressures from 50 psi to 1000 psi . . . temperatures from minus 80°F to 450°F. For sealing all fluids except molten alkali metals and some fluorine compounds in the higher temperatures. For information on applications . . .

Write today for Dura Seal Catalog No. 455-CP

DURAMETALLIC CORPORATION, Kalamazoo, Michigan

When inquiring check CP 5356 opposite last page

on deionizer are fabricated from PVC. This helps maintain the quality of the water. In a second application, chromic acid is handled in concentrations of 10-40% in PVC lines around a 1500 gal tank. In third application a 1% concentration of chromic acid is processed, and in a fourth the PVC piping withstands sulfuric acid. In fifth application, PVC is employed for drainage of regeneration wastes. Operating temperatures are 25-75 psi and temperatures range from 50 to 90°F.

Another advantage found for the plastic piping system is that scale is eliminated from lines, preventing discoloration and contamination. Also, hazards to personnel and equipment caused by leakage have been avoided.

(Piping system was fabricated with PVC injection molded fittings made by Tube Turns Plastics, Inc., Dept. CP, 2929 Magazine St., Louisville 11, Ky. Check CP 5357 opposite last page.)

Stabilizes molybdenum sulfide lube so that it won't form acids under extreme conditions . . .

if MoS_2 reacts with moisture in the air, it can form acids which corrode bearings

Under certain severe applications involving extreme temperature, pressure, speed, or exposure, molybdenum sulfide lubricants have reacted with moisture in the air to form acids which corrode some bearing materials.

To completely eliminate this possibility, manufacturer coats dry MoS_2 powder before its formulation into a liquid lubricant. This coating is a chemical buffer which prevents formation of free acid under any conditions, even if the protective vehicle evaporates or is oxidized.

Stabilized MoS_2 comes in formulations of oils, greases, and coatings, and in powder and wax-stick forms.

(Stabilized molybdenum sulfide is a product of Lubricants Div., The Lockrey Co., Dept. CP, Southampton, N.Y. Check CP 5358 opposite last page.)

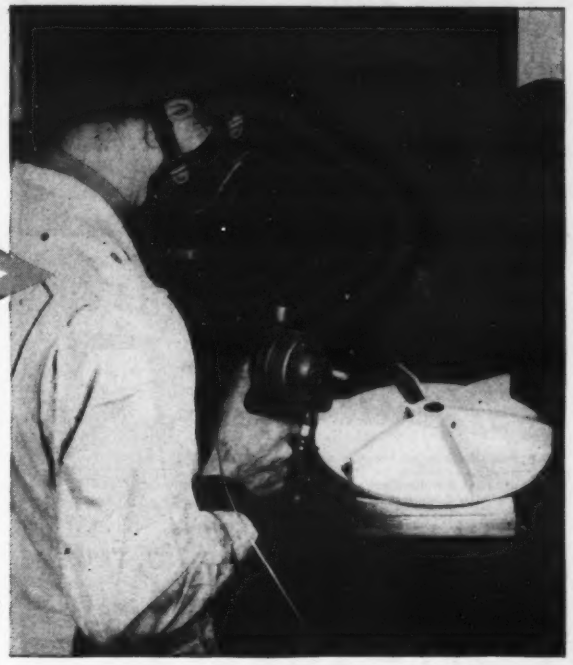
Catalog of 170 pages on chemical valves

Catalog of seven sections and 170 pages describes and illustrates valves and controls for the nuclear and chemical industry. Over a hundred different products are covered.

Catalog A-155 is issued by Associated Valve & Engr. Co., Dept. CP, 1150 W. Marquette Rd., Chicago 21, Ill. Specify CP 5359 opp. last page.

How Stauffer Chemical whips fan corrosion

Silver metallizing stretches wheel life from 6 weeks to better than one year in corrosive gases.



Fan rotor being metallized with silver for protection against corrosive gas

The *Stauffer Chemical Company,* Niagara Falls, N. Y., operates a chloro-organic acid unit in which process fans are used to convey corrosive gas in the operation of a column. Gas is primarily anhydrous hydrogen chloride, contaminated with small quantities of chloro-organic acid compounds.

A number of different coatings were tried out in an effort to prolong the life of the stainless steel wheels and shafts, as well as the cast-iron housings. Best of these lasted 4 to 6 weeks on the wheels, 2 to 4 months on the housings.

Test work carried on with *Metal-Cladding, Inc.,* of North Tonawanda, N. Y., indicated that fine silver was relatively unaffected by the gases in use. So the first wheel was metallized with this material after the base metal had been mechanically cleaned, sprayed with .005" of molybdenum for a bonding base, and .020" of nickel for toughness. Final silver coating was .025" thick.

A year later the first metallized surfaces were still in excellent condition. Since the cost of the metal spray work was about equal to the cost of a new untreated unit, the application paid for itself in about three months. In addition, inspection time and downtime were substantially reduced.

The following Metco* System contractors are set up to help you solve your corrosion problems with metallizing. For further information or copy of descriptive bulletin, write, wire or phone Metco Systems headquarters, address and phone number below.

**Reg. U.S. Pat. Off.*

Metco System Contractors

Akron Sand Blast & Metallizing Company
Arthur Tickle Engineering Works, Inc.
Dix Engineering Co., Inc.
F. W. Gartner Company
Gulf Engineering Company, Inc.
Metal-Cladding Inc.
M W Protective Coatings Div. of Metalweld, Inc.
St. Louis Metallizing Co.
The Southern Galvanizing Company

Metco Systems

10 Bridge Street, Westbury, Long Island, New York

Telephone: Edgewood 4-1308

METCO SYSTEMS
10 Bridge Street,
Westbury, Long Island, N. Y.

Please send me descriptive bulletin on the Metco Systems.

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title _____

company _____

address _____

city _____ zone _____

state _____

When inquiring check CP 5360 opposite last page

PALMER-SHILE

Materials

HANDLING EQUIPMENT

Engineered and Built to meet your needs

CONTROLLED PRECISION DUMPING or POURING

P-S DRUM and BARREL TILT

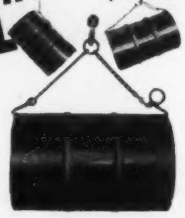
Especially ideal for handling chemicals, solvents, powders, etc. Unit for handling carboys also available. Equipped with two safety type locking devices and all steel, welded yoke. Turns 360° through worm drive. Hand-operated chain drive or 12" O.D. hand wheel.

Item B-731
$198.50

LOADING and UNLOADING TRUCKS

Item B-205
$18.50

P-S DRUM and BARREL SLING



Handles drums, barrels, kegs that have a lip. Excellent for handling draining of drums. Heavy welded chain and forged grab hooks. Weight approx. 8½ lbs.

CONVENIENT, SAFE HANDLING of LIQUIDS *with*

P-S Combination TRUCK and DRAIN RACK loads automatically

DETACHABLE HANDLES

Item NS 506 DH (detachable handles)
$54.90

Item NS 506 (handles welded to frame)
$52.70

This dual purpose truck can be used to move barrels or drums and also serve as a drain rack. Available in two styles—handles welded to frame or with detachable handles that can be pulled out to conserve floor space. One set of handles can serve any number of trucks. Sturdy welded construction. Free-rolling 8" roller bearing wheels. Weight approximately 90 lbs.

DESIGNED AND MANUFACTURED BY

Palmer-Shile Co.

16016 FULLERTON AVE., DETROIT 27, MICH.

BOSTON, Mass., CO 6-0570 • BURLINGAME, Calif., DI 2-0823 CHICAGO, Ill., Michigan 2-7407 • CLEVELAND, Ohio, SU 1-3235 • DENVER, Colo., AL 5-3984 • FLINT, Mich., CE 8-6881 • FORT WAYNE, Ind., EA 2816 INDIANAPOLIS, Ind., ME 5-2587 • LOS ANGELES, Calif., RA 3-3733 ST. LOUIS, Mo., PR 1-1474 • WHITE PLAINS, N. Y., White Plains 6-1354

When inquiring check CP 5361 opposite last page

Non-stop operation of sixty electric fork trucks can cause heroic confusion in a recharging department. Anheuser-Busch, using a "basketball scoreboard", is able to . . .

recharge sixty batteries daily . . . without a minute's downtime

HOW do you change over 60 batteries daily for a giant fleet of industrial trucks in continual 24-hour use, without causing even a temporary break in production? Anheuser-Busch, operating the nation's largest brewery, in St. Louis, Mo., has come up with the answer. The solution involves a system of signal flasher lights, a speedy method of servicing the 2000-lb cells, and a plan for closely coordinating men, batteries, and machines.

The battery changeover system can best be described with a look at the company's bottling, canning, and warehousing operation — an eight-story building some two blocks long and a block wide. Here, 20 fork trucks, part of a fleet of about 60 trucks, are in steady use stocking inventory and filling orders. With a large floor inventory to be maintained and a constant flood of orders to fill, the trucks operate round-the-clock. Being in constant use, trucks call for battery change each shift. While the battery can run more than eight hours without a recharging, it cannot run long enough to cover two full shifts.

Here are the ingredients for the trouble-free recharging system: a set of flasher signal lights, control board, schedule of battery changes, a hand truck for shifting batteries, and a stand-by fork truck for use as shuttle-truck.

Here's how it works: Electrician on duty maintains a schedule by which he rotates batteries when they are ready for charging. Each truck has its own number — so has each battery. At any time, the electrician can tell how long a particular battery on a particular truck has been in use.

When a battery is due for a change, electrician flashes the truck number by means of a figuregram controller

Built-in skids and L-shaped battery retainer make battery handling simple with fork-lift truck

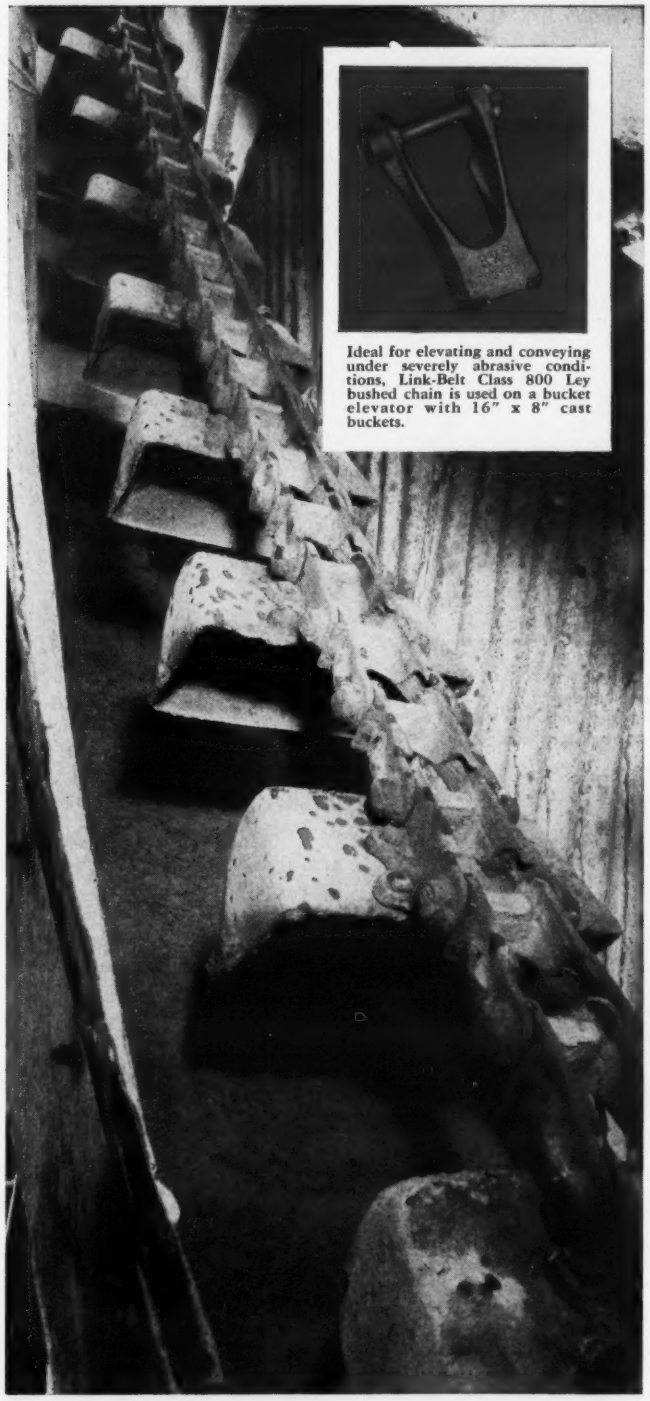
When operator's "number comes up" he heads for the battery shop where a freshly charged truck is waiting for him

similar to the kind used for flashing scores on athletic scoreboards. The number is written out by electric bulbs on both sides of signal boards suspended from the ceiling in the warehouse. There are three boards strategically placed so that driver is sure to spot his number no matter where he is working.

(*Please turn to page* 127)

Channels welded to bottom of battery permit easy handling of battery

Here's a chain designed specifically for abrasive elevator-conveyor service



Ideal for elevating and conveying under severely abrasive conditions, Link-Belt Class 800 Ley bushed chain is used on a bucket elevator with 16" x 8" cast buckets.

It's long-life LINK-BELT Ley bushed chain that assures less downtime

If you're handling abrasive materials, you'll appreciate the extra wear Link-Belt builds into its Ley bushed chain. The barrels of this rugged cast chain have renewable hardened steel bushings in which steel pins ride. For extraordinarily severe service, manganese steel bushings and alloy steel pins can be furnished.

The design and manufacturing refinements that go into the Ley bushed line are typical of the care that Link-Belt gives to every detail of every chain. And, because Link-Belt builds a complete line, you're sure to get the one best-suited to your exact requirements. Ask your Link-Belt representative or distributor for all the facts on Link-Belt chains and sprockets today.

No ONE chain serves every purpose—get the RIGHT one from LINK-BELT's complete line

LXS chains are made to close tolerances from carefully selected steels. Ideal for rugged drive and conveyor service.

Class C combination chain—popular, durable, low-cost design for elevators and conveyors.

Class SS bushed roller chain with straight sidebars—for practically any conveyor or elevator.

Link-Belt "Flint-Rim" cast sprockets give extra long life. Cast steel sprockets for most severe service.

LINK-BELT

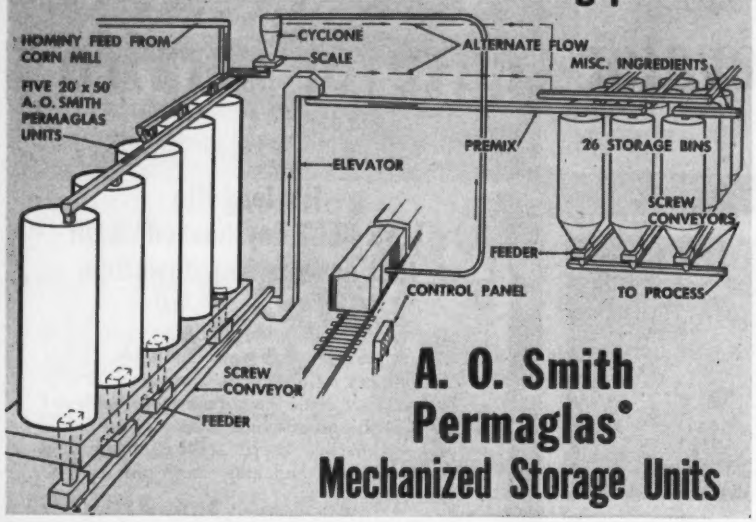
13,514

CHAINS & SPROCKETS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office: New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.

When inquiring check CP 5362 opposite last page

NEW solution to materials handling problems



A. O. Smith Permaglas® Mechanized Storage Units

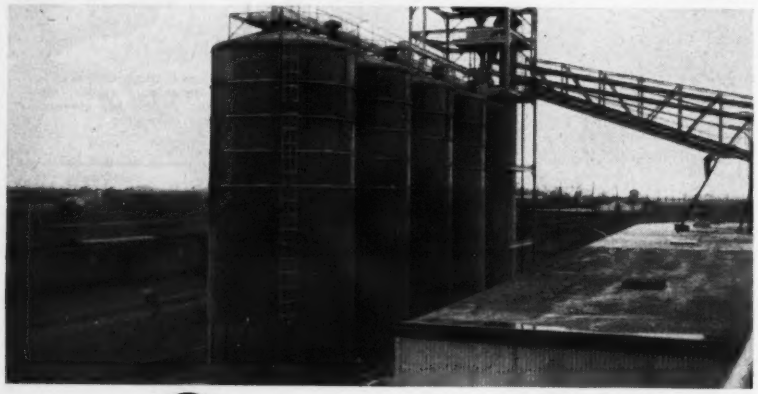
Here's the most efficient way to handle free-flowing materials at lower cost.

Glass-protected steel inside and out — five *Permaglas* Storage Units with mechanical bottom unloading are shown in the flow diagram above. They serve in a modern materials handling system used in the manufacture of Gaines Homogenized Dog Food — a product of General Foods Corp., Kankakee, Illinois.

Incoming raw materials are moved by vacuum from railroad cars to these units. Then A. O. Smith's exclusive mechanical sweep-arm bottom unloaders take over . . . remove materials — on a first-in, first-out basis — as they are needed for mixing. Handling and storage of individual bags or containers are eliminated. Accurate proportioning of ingredients assures consistent product quality.

Mail coupon for more information about A. O. Smith's *Permaglas* Mechanized Storage Units for more efficient bulk materials storage and handling.

New 6-page bulletin covers complete specifications of Permaglas Storage Units with mechanized bottom unloader.



Through research ...*a better way*

A.O.Smith
CORPORATION
HARVESTORE DIVISION
Kankakee, Illinois
Distributor: SPROUT-WALDRON
Muncy, Pennsylvania

A. O. SMITH CORPORATION
Harvestore Division • Kankakee, Illinois

Please send me complete facts about *Permaglas* Mechanized Storage Units.

Name .....

Address .....

City ..... State .....

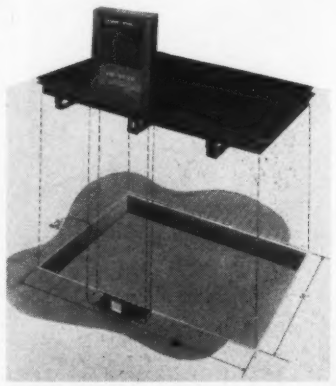
When inquiring check CP 5363 opposite last page

Installed in three hours, scale has capacity of 1½ tons

Uses: Floor scale is designed for weighing material on skids or hand trucks.

Features: Unit is simple to install — requires only mounting in floor recess. Can be installed for use in three hours time.

Description: With capacity of 3000 lb, scale has 29 x 94" platform. Corner suspension level method provides free movement of platform in all directions.



Platform scale requires only 7½-inch floor recess for installation

Weigh-beam is graduated in one-lb markings with each five and 25-lb marking enlarged.

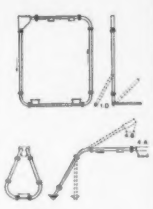
(Platform Scale is manufactured by Ferguson Products Co., Dept. CP, Box 185, McHenry, Ill. . . . or for more information check CP 5364 opposite last page.)

Ten telephone tips for cutting costs

Attractive 12-page, pocket-size publication gives ten cost-cutting tips involving intra-plant telephones. Tips are based on experiences of ten industrial organizations.

"10 Ways to Cut Costs . . ." is issued by Automatic Electric Co., Dept. CP, 1033 W. Van Buren St., Chicago 7, Ill. When inquiring specify CP 5365 on form opposite last page.

Examples of a few typical circuit plans.



HERE'S HELP!

Patented SEALED-PIN CHAIN DESIGN keeps abrasives out —quadruples chain life.

COMPRESSED NEOPRENE WASHERS

Hapman TUBULAR CONVEYORS

See Us at Booth A-1006, Cleveland MHI Exposition, June 5th — 8th!

Move almost any flowable material—wet or dry—through any plane or angle . . .

Make *big savings!* Move bulk materials *automatically*—up, down, through walls, around corners and obstacles with a Hapman! Circuits like these or complex layouts engineered to *your* needs. Usually a *single* drive unit serves where other conveyors need several. Design cuts costs. Dust and liquid *tight!*

WRITE for Circuit Bulletin and Catalog C-56

Hapman CONVEYORS, INC.
DIVISION HAPMAN-DUTTON COMPANY
KALAMAZOO MICHIGAN
In British Commonwealth & Europe: Fisher and Ludlow Ltd., Birmingham

When inquiring check CP 5366 opposite last page

FOR MAXIMUM SAFETY

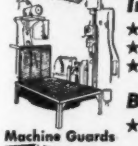
all over your plant use Safety GRIP-STRUT

Pat. Pending

the new basic material, all in one piece (including channels), not welded, riveted or expanded in steel or aluminum, in standard sizes and gauges. Safety GRIP-STRUT presents an open space, in a diamond pattern, in excess of 55% of the area for ready access of light and air and gives a positive NON-SKID footing in all directions. Ideal for work platforms, stair and ladder steps, flooring, balconies, catwalks, machinery guards, fire escapes and for original equipment safety treads.

Work Platforms

Flooring



Machine Guards

Balconies

Important Safety Features

★ Fire proof
★ Slip proof
★ Maximum strength
★ Minimum weight
★ Easy to stand on
★ Cool in summer—warm in winter

Big Economy Features

★ For balconies—no extra light needed below—no extra heat.
★ No extra supports necessary—channels are integral part of the material
★ No secondary sprinkler heads needed
★ Self-cleaning
★ Cut and installed like lumber by your own maintenance force
★ Low in original cost

Distributors in all principal cities. Consult yellow pages in phone book under "GRATING."

SEND FOR NEW CATALOG

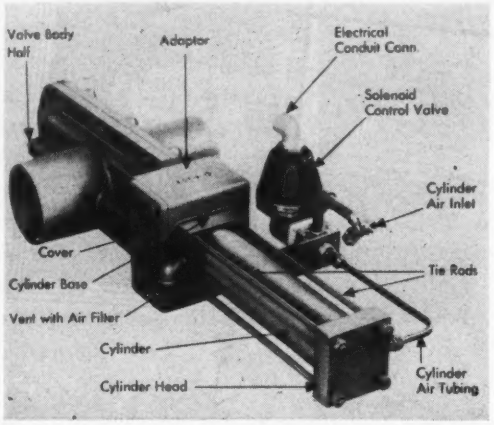
GRIP-STRUT division
THE GLOBE COMPANY • *Manufacturers since 1914*
4006 S. PRINCETON AVE. • CHICAGO 9, ILL.

When inquiring check CP 5367 opposite last page

Tight shut-off in slide gate isolates any section of system . . .

valve for pneumatic conveying equipment can be operated manually or remotely

Uses: Valve, for manual or automatic operation, can be installed in branch lines to cut-off inactive portions of pneumatic conveying system. Unit is also useful for isolating a portion of system . . . between a cyclone collector and vacuum source, for example, to permit periodic discharge to storage bins.



Segregating valve equipped with air cylinder and solenoid control valve for air-electric operation. Valve sizes to 12" are available

Features: Non-clogging unit has completely-enclosed, dust-proof slide and has variety of operating mechanisms to suit requirement of installation.

Description: Valve assembly comprises two main elements — valve body and attached operating mechanism. Body contains slide gate of ⅛-inch plate. Body is of cast iron. Valve sizes available are 4, 5, 6, 8, 10, and 12".

Several operating mechanism types are available. In one instance an air cylinder is used to open or close valve with compressed air at 80 to 100 psig. For automatic operation by master sequence control switch, a solenoid pilot valve is used to admit supply of air to cylinder. Remote manual operation of valve can also be provided by use of air cylinder and air supply regulated by hand control valve. Valves can also be operated with push-pull rods or with chained wheels.

(Segregating valve is product of Allen-Sherman-Hoff Company, Dept. CP, 259 E. Lancaster Avenue, Wynnewood, Pennsylvania . . . or for more information about manufacturer's product, reader may simply check CP 5368 on the convenient Reader Service slip which is located opposite last page.)

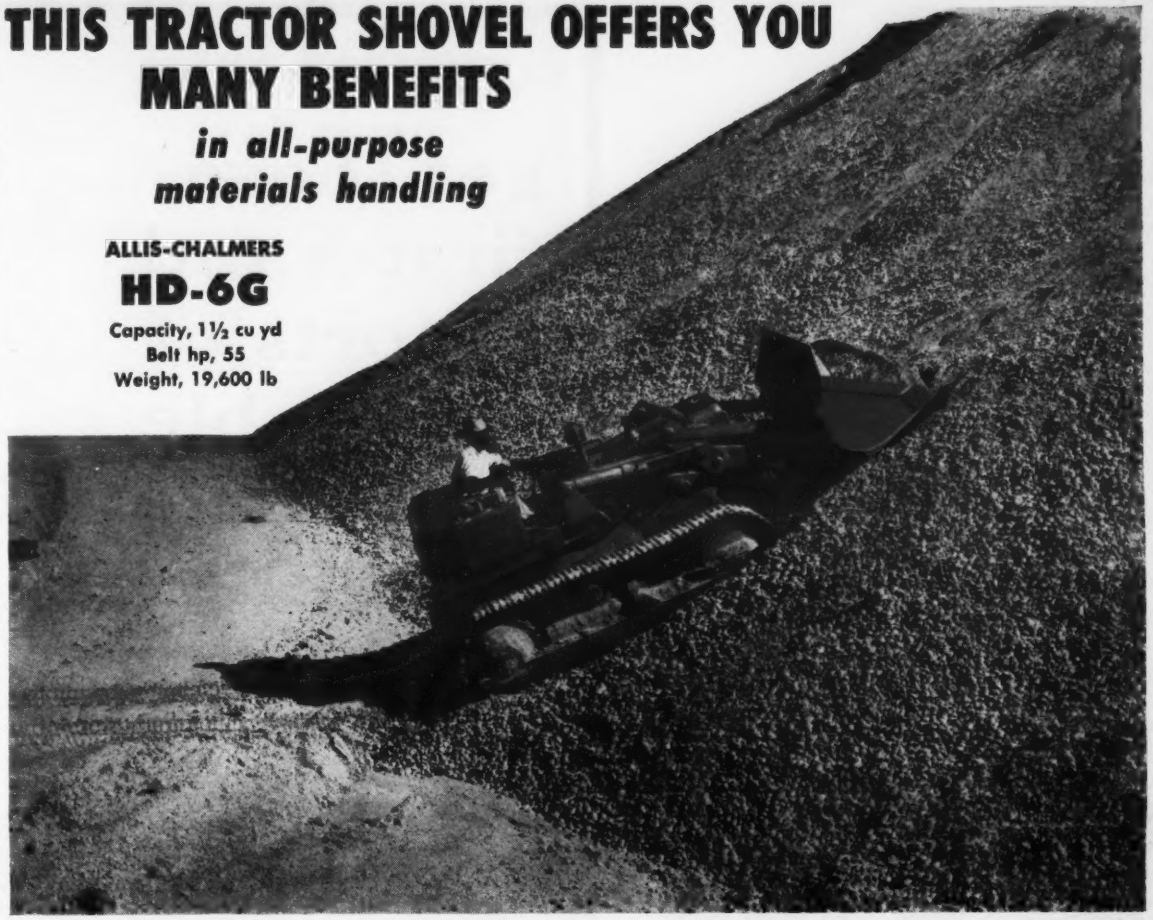
THIS TRACTOR SHOVEL OFFERS YOU MANY BENEFITS

in all-purpose materials handling

ALLIS-CHALMERS

HD-6G

Capacity, 1½ cu yd
Belt hp, 55
Weight, 19,600 lb

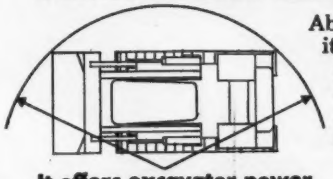


The HD-6G offers you a combination of materials handling advantages found only in the hydraulic tractor shovel method — a method pioneered, proved and improved by Allis-Chalmers.

It offers big capacity

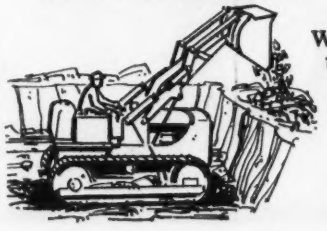
Bucket handles 1½ cu yd in any bulk material. For light materials, a special 2¼-cu-yd bucket is available.

It offers small-loader maneuverability



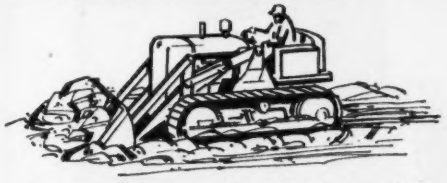
Ability to pivot around its inside track makes the HD-6G surprisingly maneuverable. It can turn from a 9-ft aisle into a 9-ft bin!

It offers excavator power



Weight, power and traction behind a big-capacity hydraulic system gives it down pressure and penetrating ability for excavating and crowding into hard-packed material.

It offers flotation for soft going



With crawler tracks, the HD-6G travels almost anywhere, in unpaved yards, through mud, sand or snow. In many cases, it works right up on a stockpile. This enables it to store many more yards of material in a limited area.

Find out what this combination of abilities can do for you. Write for literature or ask your Allis-Chalmers Construction Machinery dealer to show you the HD-6G in action. Also, three larger models — up to 4-cu-yd capacity.

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION
MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS

When inquiring check CP 5369 opposite last page

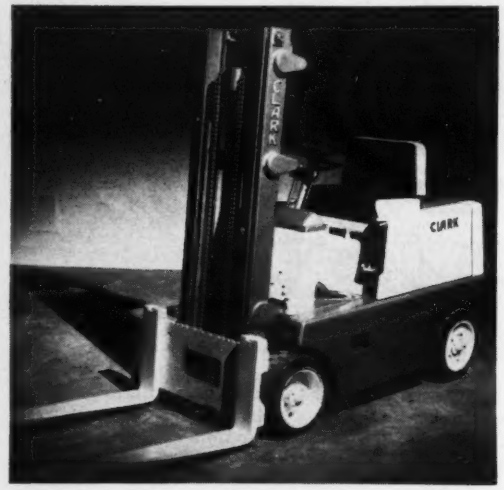
Swing-up engine hood, other features mark truck redesign

Changes include self-adjusting brakes, improved gradability, interchangeable parts

Uses: For in-plant or outdoor handling of palletized material or skids. Trucks, for indoor work, are equipped with solid tires, while pneumatic-tired models are available for all-weather outside work.

Ability of these redesigned trucks to take steep grades open many applications of a more "rough and tumble" nature than in-plant trucks are usually considered for. These will probably develop as occasional jobs rather than primary jobs since trucks are designed for conventional plant use.

Features: Maintenance on truck line is eased by spring-balanced, one-piece swing-up hood which completely exposes engine. Automatically adjusting hydraulic brakes eliminate all manual

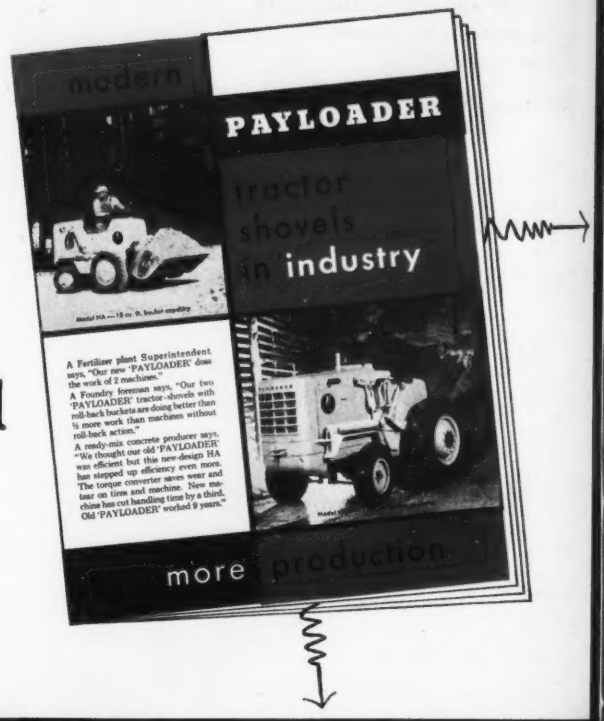


Solid-tire models reach full-load speed of 8 mph and pneumatic-tired trucks reach speeds of 12 mph

adjustment — only servicing required is replacement of brake linings. Major components such as transmission, torque converter, dash assembly parts and most engine accessories are interchangeable on all models in the line. Four-bolt foreplate provides quick access to transmission.

Description: Steer and drive wheels on new line are the same diameter. Distance from front axle to base of fork has been reduced to permit operation in narrow aisles. Power train provides non-stop, forward-reverse shifting and delicate control of both full-load and no-load inching operation.

get these first-hand reports of profitable bulk-material handling methods

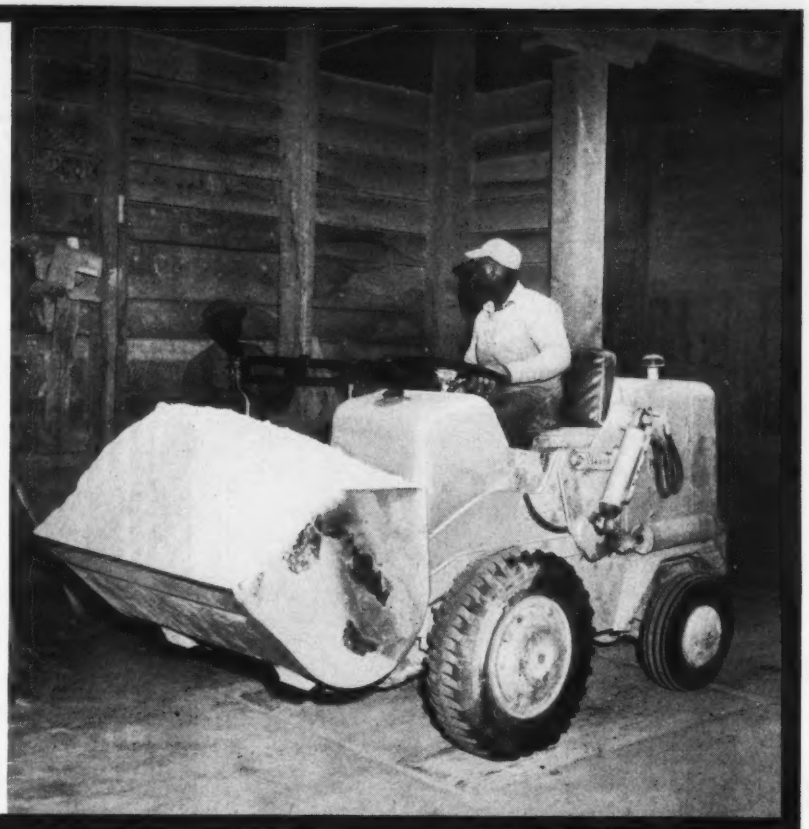

modern
PAYLOADER
tractor shovels in industry
A Fertilizer plant Superintendent says, "Our new 'PAYLOADER' does the work of 2 machines."
A Foundry foreman says, "Our two 'PAYLOADER' tractor-shovels with roll-back buckets are doing better than ½ more work than machines without roll-back action."
A ready-mix concrete producer says, "We thought our old 'PAYLOADER' was efficient but this new-design HA has stepped up efficiency even more. The torque converter saves wear and tear on tires and machine. New machine has cut handling time by a third. Old 'PAYLOADER' worked 9 years."
more production

Continuous, Trouble-Free Service at APOTHECARIES HALL COMPANY

Apothecaries Hall Company is one of the oldest joint stock companies in Connecticut and have been in the fertilizer business more than 100 years. They have been "PAY-LOADER" users since 1942 and now use three model HA's and one larger model HAH. They say, " 'PAYLOADER' units are built for continuous trouble-free service and that's just what we get. The new model HA roll-back bucket increases the delivery load. This is especially true in rail car unloading."

10 Years Satisfactory experience with 10 "PAYLOADER" units at VALIANT FERTILIZER COMPANY

"Our new HA 'PAYLOADER' does the work of 2 machines." Ernest Dickerson, plant supt. of Valiant Fertilizer company, also adds, "This increase is made possible by the roll-back bucket design which carries more bulk material. The low-carrying bucket offers better vision and safety. Torque converter and bucket design gives longer tire wear, less spillage and practically no floor clean-up.



More than 35 years of experience in tractor-shovel design and application has been built into "PAYLOADER" units by The Frank G. Hough Co., originators of the unit-design tractor-shovel. It is this vast experience and knowledge incorporated into the design of each "PAYLOADER" model that makes the big difference in its superior performance on any job.

The new "PAYLOADER" Models HA and HAH include many exclusive features which pay off in greater output per hour. They are small and compact for easy maneuvering and handling in close quarters, yet have ample dumping height for most any job. The 40° bucket roll-back gets full loads fast and, combined with the hydraulic shock absorber, enables the "PAYLOADER" to carry full loads in a higher gear without spillage. These two features are BIG reasons why these machines give more production than heavier machines with bigger engines.

The full-reversing transmission and torque converter provide a wide range of easily obtainable speeds and maximum efficiency in handling each load. Extremely rugged construction . . . finest quality in each component—assures continuous performance with a minimum of "down-time" and a longer useful life.

It's the difference in performance that has made the "PAYLOADER" the decided choice in thousands of plants throughout the world—there are more in service today than all other makes combined. A "PAYLOADER" is your best investment now—and for the future.

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

THE FRANK G. HOUGH CO.
744 Sunnyside Ave., Libertyville, Ill.

- ☐ Send profitable bulk-handling reports
- ☐ Literature on model HA (1⅛ cu. ft.) and model HAH (1 cu. yd.) "PAYLOADER"
- ☐ Literature on larger units to 2¼ cu. yd.

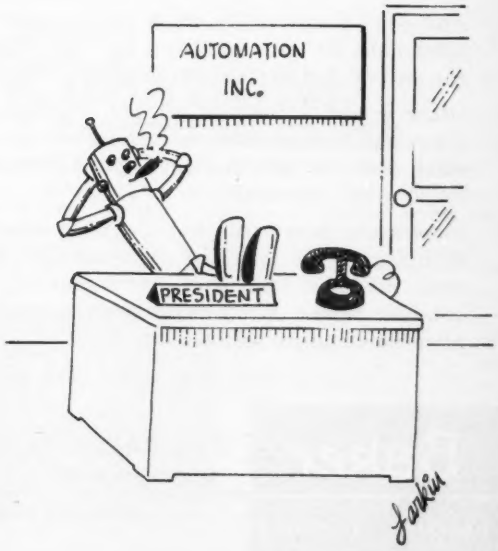
Name_____
Title_____
Company_____
Street_____
City_____
State_____

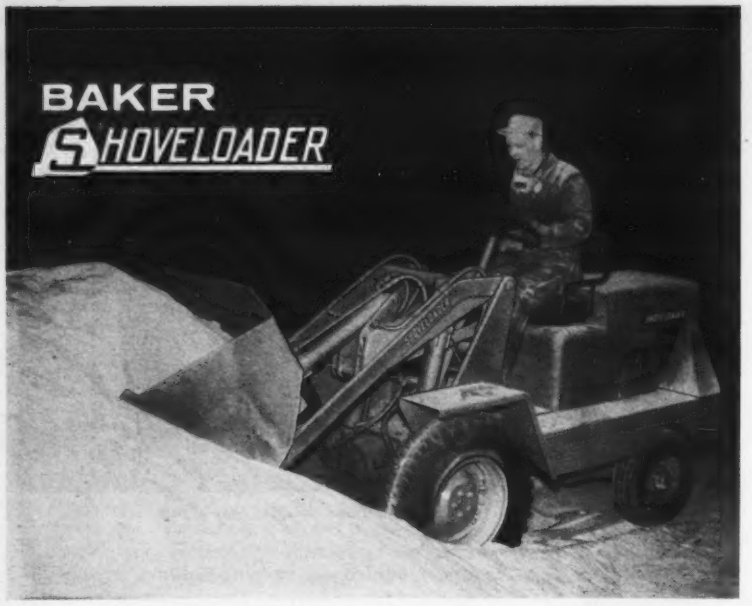
When inquiring check CP 5370 opposite last page

Swing-up hood provides easy access to engine

Levers, mounted on steering column, control direction and lift operation. There is no clutch pedal. Solid-tire models attain full-load speed of 8 mph and *gradability of 20 to 30%*. Pneumatic-tire models have full-load speed of 12 mph and gradability of 26 to 33%.

(Clarklift Trucks are manufactured by Industrial Truck Division, Clark Equipment Company, Dept. CP, Battle Creek, Mich. . . . or for more information check CP 5371 on form which is located opposite last page.)





...mechanizes your bulk handling for less per day than the cost of a laborer with a hand shovel

Baker Shoveloader costs around $400 less than comparable machines—enables you to mechanize bulk material handling for about $10 per day—less than the pay of a laborer with a hand shovel.

Designed for continuous heavy work, Shoveloader takes a 12 cubic foot bite weighing up to 1500 pounds. Four forward speeds with top speed of 14 mph make this a fast machine and insure better operation on ramps and rough ground.

And don't forget safety when you compare. The operator is behind the lift arms and has a full 360° view at all times. He can see both bottom and end plates of the bucket when loading.

Other exclusive features include "all-in-one" power train (engine, transmission, drive axle, wheels), longest forward reach, and the famous Baker hydraulic pump and cylinders for long-life dependability.

Shoveloader is versatile, too. Use it for other plant operations with any of the following accessories available at low extra cost: lift-forks, solid tires, narrow bucket, crane hook, and catalytic muffler. Write us or telephone your Baker representative for complete information.

See Baker Trucks in action at the MHI Show, June 5-8

Baker handling equipment

THE BAKER-RAULANG COMPANY
1208 West 80th Street • Cleveland 2, Ohio
A subsidiary of Otis Elevator Company

When inquiring check CP 5372 opposite last page

Lifts and dumps carboys, steel or fiber drums

Uses: Drum lift enables one man to handle steel drums (55 and 30 gals), fiber drums (18 to 23" diam), and acid carboys.

Features: Lift power is supplied by foot-operated hydraulic jack. Drums can be raised to height of 53-inches for pouring.

Description: All-steel drum lift is rated at 750-lb capacity. Drum is held by girdle, permitting 360° drum rotation. Truck

Brakes on drum-lift arm hold drum at any angle

lifts drum from floor for pouring, stacking, or rotating to mix contents. Unit will stack drums two-high. Brakes on drum-lift arms hold drum at any angle. Four-inch oil, gas, and spark-proof roller-bearing casters are normally supplied. Eight-inch diam spark-proof conducting casters can be supplied on special orders.

(Drum Lift is manufactured by Sterling, Fleischman Co., Dept. CP, Broomall, Pa. . . . or for more information check CP 5373 opposite last page.)

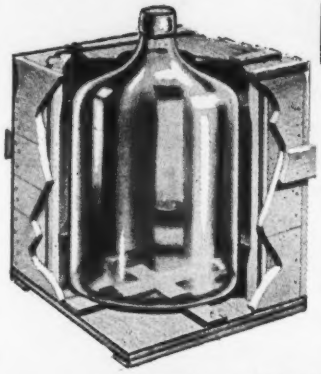
Your guide . . . to more material handling ideas and equipment is the alphabetical product directory beginning on page 234 in this issue

HERCULES
CORK CUSHIONED
5-6½- and 13 gallon

aero
RUBBER CUSHIONED
5-6½- and 13 gallon

ARMSTRONG
CORK CUSHIONED
5-6½ and 13 gallon

CARBOY BOXES



Treen manufactured 5 — 6½ — and 13 gallon carboy boxes are quality built in accordance with ICC regulations, with features that give all-point protection; reducing hazards and breakage, ease in handling and compact loading. Available with either "A" Hood or Export Hood.

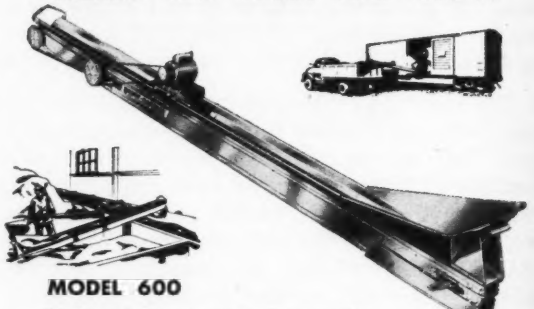
WRITE FOR COMPLETE DATA

"Aces In Cases" FOR OVER 50 YEARS

TREEN BOX COMPANY
TIOGA AND MEMPHIS STS., PHILADELPHIA 34

When inquiring check CP 5374 opposite last page

BELT HANDY-HANDLER
MEANS TOP VALUE AND UTILITY



MODEL 600

Lightweight conveyor for moving chemical powders, salt, stoker coal and many other bulk materials. All bolted, aluminum frame construction for easy maintenance and servicing. Easily adapted. Easy one-man operation and positioning. Lengths from 10 to 28 feet. Write for complete conveyor catalog.

PRICES FROM $300.00

THE BELT CORPORATION
7905 Stahl Rd., Orient, Ohio

Send me complete Belt conveyor catalog, showing models, capacities, accessories and applications.

NAME_____

ADDRESS_____ CITY_____

When inquiring check CP 5375 opposite last page

Battery Recharging System

(*Continued from page* 121)

When his "number comes up", the driver completes the trip he may be making, then heads for the battery department. There, waiting for him, is another fork truck with fully charged battery. He picks up the new truck and is ready for work again.

The electrician immediately begins servicing the truck left with him. Batteries are handled by a one-ton capacity, operator-led fork-lift truck. A recently charged battery is taken from the charge rack and promptly put back on the waiting fork truck. This truck then becomes the new stand-by and is ready to go into action as soon as the next truck comes in for servicing.

Operation takes only minutes

Whole operation takes only minutes. Before the hand truck was put into use, the one-ton batteries were laboriously — and somewhat perilously — pushed by hand off the truck's battery compartment onto a portable table. Battery was then pushed along table's conveyor rollers to the recharging rack. Getting a charged battery back on the truck involved reversing the above procedure — a cumbersome and time-consuming business.

Some slight modification had to be made on the battery and battery compartment to enable change-over to be made under the new system. Normally, a battery sits flush on the floor of the battery compartment, leaving no room for forks to be inserted. This was solved by welding two steel channels on the bottom of all batteries — thus equipping them with "built in" pallets. The holding clips or stops which keep the battery in place had to be removed from one side of the compartment so that battery could be lifted out. In their stead, an L-shaped section was installed at compartment's base to keep the battery secure. Forks need only lift a few inches to clear cradle.

Flasher lights are the most recent innovation in this system. Previously, all 20 trucks had to be serviced in a single hour, during the staggered lunch periods. Now, of course, changes can be made throughout the day.

(Transtacker hand operated fork-lift truck is manufactured by Automatic Transportation Co., Div. of Yale & Towne Mfg. Co., Dept. CP, 149 W. 87th St., Chicago 20, Ill. . . . or for more information about this product reader may simply check CP 5376 which is located on convenient Reader Service slip opposite last page.)

(Flasher scoreboard light is a product of General Electric Supply Company, Dept. CP, 2653 Locust Street, St. Louis 3, Missouri . . . or for more information about this product reader may simply check CP 5377 which is located on convenient Reader Service slip opposite last page.)

GGG-38
proportioning costs up?
Cut 'em down with the simplest, most dependable, accurate and inexpensive system you can own!
You can use any number of these Richardson units plus others—coupled with a Richardson Remote Stop Counter Panel—to create an automatic proportioning system for your plant or mill.
Like to switch to automatic proportioning?...or saddled with a complex, inefficient or outmoded system that isn't giving you that *extra* increment of speed and accuracy that you must have to show a real profit?
Here's the answer. By combining standard Richardson Scale batch weighing units like those shown here with a Richardson Remote Stop Counter Panel, you get virtually continuous-stream delivery, with the kind of accuracy you couldn't hope for with a continuous weighing scale. What's more, with a system made of simple, easy-to-maintain Richardson units—interlocked for simultaneous delivery—you get an inexpensive system that's tailored to fit the exact needs of your plant or mill. In many cases, depending on materials, complexity of the blend and other factors—a *simplified* Richardson Automatic Proportioning System can do the job of a much more expensive, much more complex fully-automated system.
WRITE TODAY for further information about cost-saving, space-saving, labor-saving Richardson Proportioning Systems. Ask Richardson for a recommendation to solve *your* particular problem. RICHARDSON SCALE CO., Clifton, N. J.
HHH-38
Richardson
MATERIALS HANDLING BY WEIGHT SINCE 1902
RICHARDSON SCALE COMPANY, Clifton, New Jersey
Atlanta • Boston • Buffalo • Chicago • Cincinnati • Detroit • Houston • Memphis
Minneapolis • New York • Omaha • Philadelphia • Pittsburgh • San Francisco
Wichita • Montreal • Toronto • Havana • Mexico-City • San Juan
Richardson Scales S.A., 1-3 Rue de Chantepoulet, Geneva, Switzerland
Richardson Scale Co., Ltd., 40-42 George Street, Nottingham, England
E-50 Triplex
Remote Stop Counter Panel

When inquiring check CP 5378 opposite last page

Robinson Air-Activated Conveyor

The ***Low-volume*** *Air Conveyor*

▶ Heart of the Robinson Air-Activated Conveyor System . . . the Activator which so "fluidizes" the charge, enabling it to be handled with low volumes of air.

Averages 1 Cubic Foot of Air per Pound of Materials Handled

Right here is one reason — and a stand-out reason — why the Robinson Air-Activated Conveyor is so economical in handling bulk dry-pulverized and fine-granular materials. Compressed air costs money so, if you can hold air costs down, as with the Robinson, you keep handling costs down. And no other power is necessary to operate a Robinson System.

The reason why the Robinson System can operate with such low air volume is due to the fluidized nature of the charge when transported through the pipes. Pressure alone will not suffice. It requires this Robinson Air-Activation or fluidizing effect. Material "flows" rather than blasts through.

Many Robinson Systems are in service handling a variety of products and in some cases are transporting them several thousand feet. This system may be just what you need for handling those dry, bulk materials in your plant. It has several outstanding features which we'll be glad to discuss at your convenience.

ROBINSON Air-Activated **CONVEYOR SYSTEMS**

A Division of Morse Boulger Destructor Co.

80-T FIFTH AVENUE • NEW YORK 11, N. Y.

Representatives in Principal Cities

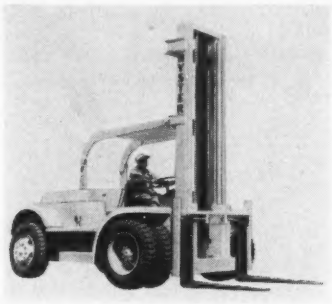
When inquiring check CP 5379 opposite last page

MATERIAL HANDLING

Handles up to 10 tons under any weather conditions . . .

using gasoline or diesel power, unit travels at 20 mph

Uses: Designed for use under all weather or surface conditions, lift truck can handle loads up to 20,000 lb at speeds of more than 20 mph in either forward or reverse.



Traveling on six wheels, truck is available with diesel or gasoline

Features: Driver control and maneuverability are maintained through vacuum-powered brakes, center-point steering, and outside turning radius of 179 inches.

Description: Traveling on 9:00 x 20, 12-ply tires, unit is available with gasoline or diesel power. Standard lift height is 17½ feet; optional heights available to 24 feet.

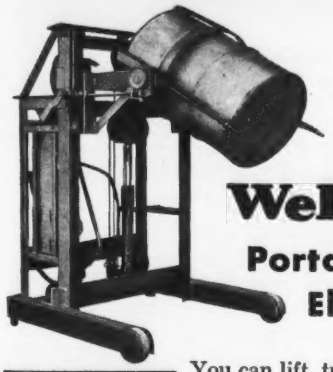
(TC-200 is product of The Hyster Co., Dept. CP, 2902 N. E. Clackamas St., Portland 8, Ore. Check CP 5380 opp. last page.)

Safe dockboard specs set forth

Six-page bulletin is printed in two colors. Describing several models of dockboards for industrial use, it contains a table showing safe specifications for rise, length, and ramp slope for standard industrial trucks.

Bul D-155 is issued by Kelley Co., Inc., Dept. CP, 316 E. Silver Spring Drive, Milwaukee 17, Wisc. Specify CP 5381 opposite last page.

Simplify, Speed Up DRUM HANDLING



with New

Weld-Bilt Portable Drum Elevator

"Weld-Bilt" PRODUCTS

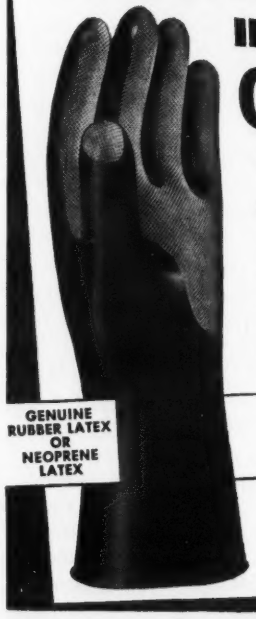
You can lift, transport, store and DUMP all sizes of drums faster, easier, with this new WELD-BILT Portable Drum Elevator. Unique worm-gear tilting mechanism makes "last-drop" dumping safer, more efficient, with minimum effort. Lift, electric-hydraulic operated, is also available for hand operation or fully electrified. Jack-up type steering permits easy, safe positioning.

Write for prices on this important time and labor-saver.

WEST BEND EQUIPMENT CORP.
MATERIALS HANDLING ENGINEERS
322 Water Street, West Bend, Wisconsin

When inquiring check CP 5382 opposite last page

FIRM-GRIP INDUSTRIAL GLOVES



AMERICA'S MOST POPULAR HAND SAFETY GLOVES

- *Permanent* NON-SLIP on all 5 fingers and palm. Highly efficient embossed surface is integral part of glove.
- *Curved* FINGERS for comfort and easy use.
- *Tough and Durable.* Longer wear in every pair.

GENUINE RUBBER LATEX OR NEOPRENE LATEX

SEND for catalog and prices of complete Industrial Glove line.

SEIBERLING LATEX PRODUCTS
Division of Standard Industries, Inc.
NEW BREMEN, OHIO

When inquiring check CP 5383 opposite last page

Operates on steam or air at variable speeds to 50,000 cpm

Uses: Mechanical vibrator is designed for use on hoppers, feeders, molds, gage panels or packaging machines.

Features: Self-starting, bantam-sized vibrator operates on steam or compressed air at pressures from 5 to 150 psi.

Vibrator operates at infinitely variable speeds to over 833 cycles per second

Description: Four-ounce unit runs at infinitely variable speeds from zero to more than 833 cycles per second. Unit is self-cleaning, and spark-proof.

(Mechanical vibrator is product of Martin Engineering Co., Dept. CP, Neponset, Ill. . . . or for more information check CP 5384 opp. last page.)

Inside-out truck

. . . makes loading fast and easy. Trick is a false floor which rolls on steel channels. For loading, it rolls out. After as much as 1½ tons have been loaded, it can be rolled back in. Models are available for many trucks.

"Rol-Loader" is a product of Rol-Loader Corp., Dept. CPW-1, 5461 Ridge Road, Parma 29, Ohio . . . or check CP 5385.

Continental's Perma-Lining gives 100% coverage plus uniform film thickness

Continental's Perma-LINED steel containers give modern protection to hard-to-hold products

Now, the 100% protection of Continental's Perma-Lined steel containers is available for chemical, paint and petroleum products. Hot-sprayed within the formed container, and fast-baked, tough enamels cover every square-inch of inner surface. Even side- and bottom-seams, often a problem, get complete, uniform coverage.

Backed by our vast experience in tailor-made packaging, Continental Perma-Linings are available for almost every chemical, paint and petroleum product. In addition, our research department is fully prepared to develop new ones for your special use.

Why not put modern Perma-Lined steel containers to work for you? Just call your Continental representative.

TAILOR-MADE PACKAGE SERVICE

STEPPED-UP STORAGE TEST. Even after prolonged storage at 100°F., polyvinyl acetate glue fails to affect Perma-Linings. Never-ending research and testing by Continental scientists assures Perma-Lined steel containers of the highest quality.

CONTINENTAL CAN COMPANY

Eastern Division: 100 E. 42nd St., New York 17
Central Division: 135 So. La Salle St., Chicago 3
Pacific Division: Russ Building, San Francisco 4

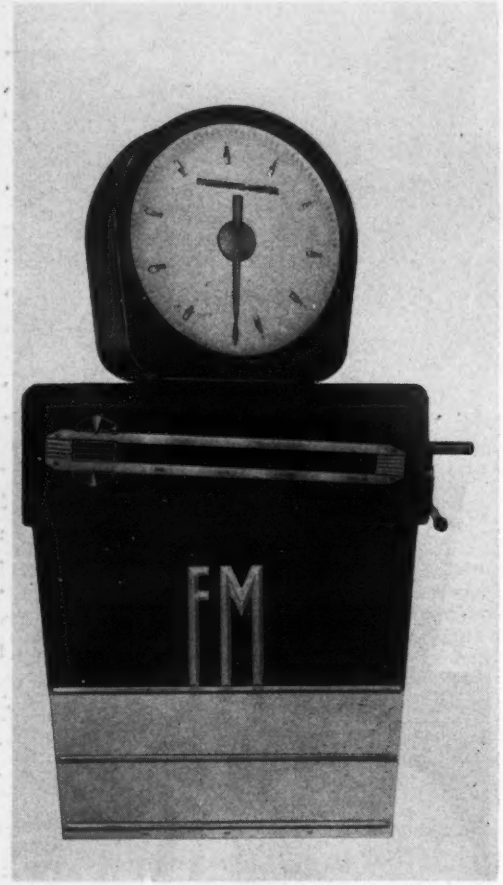
When inquiring check CP 5386 opposite last page

Handles weights to 120,000 lb, has full swivel head, rust-proof poises . . .

direct-reading scale enables weighman to use drop weights, read net weight on dial

Uses: Line of cabinet dial scales is available in 36 models for installations requiring equipment to handle up to 120,000 lb.

Features: Direct-reading dial enables weighman to utilize drop weights and still read total net weight at tip of dial indicator. Design eliminates need for weighman to add weight he obtains from drop weight window to a second weight shown at tip of dial indicator. Net weight is totaled at indicator tip.



Full swivel head permits dial to be read from any position

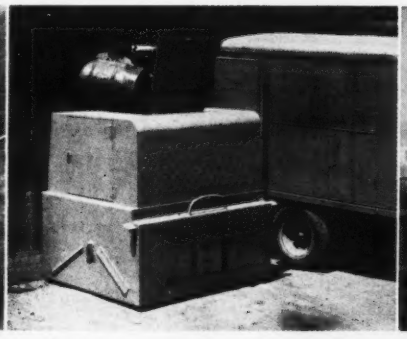
Description: Rustless metal poises have open faces that fully expose all graduations and figures. Mechanism enables dial head to rotate full 360° arc. Head can be locked in position or left to rotate as desired. Weighing mechanism is supported

These save

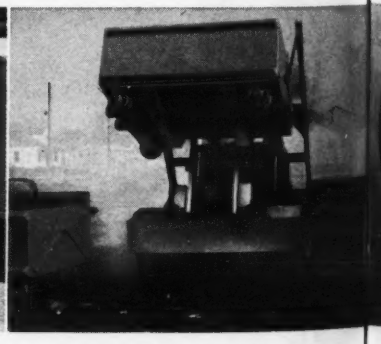
Dempster-Dumpster serving a 6 cu. yd. container with cooling fins for handling a high temperature product.

Here are a few of the hundreds of Detachable Containers we have built to solve handling problems of every description. A few others not shown include those with compartments . . . with insert containers . . . fully-insulated . . . lined with lead . . . lined with fire brick . . . with windows and doors . . . with casters . . . flat bottoms and open at one end . . . with teeth . . . with shelves for tools and supplies—and we could describe hundreds more, all served by one Dempster-Dumpster and only one man, the driver.

This 3 cu. yd. Container has skids for fork lift truck transfer.



10 cu. yd. Container widely used for refuse and combustible wastes.



Flanged wheel equipped containers for remote loading.

5176

DEMPSTER

4 manufacturers to $82,000.00 annually handling waste materials!

These four industrial plants expect to save, in labor costs alone, during the first five years service of the Dempster-Dumpster System—

A PLASTICS PLANT: $26,958.00 savings on an investment of $9,523.50 in Dempster-Dumpster equipment. Savings alone pay for equipment in two years.

A CHEMICAL PLANT: $204,076.75 savings on an investment of $40,968.00 in this equipment . . . savings pay for equipment in one year.

AN AUTOMOTIVE PLANT: $135,000.00 savings on an investment of $19,272.00 . . . savings pay for equipment in 9 months.

A PAPER AND PULP MILL: $43,104.00 savings on an investment of $10,750.00 . . . savings pay for equipment in 1¼ years.

Those are typical examples. Visualize a Dempster-Dumpster, operated by only one man, the driver, serving scores of big steel containers, one after another, in your plant. Containers of many designs and types, handling waste or salvable materials, raw or finished products, fluids including acids, combustibles, dusty materials—anything that can be handled in up to 21 cu. yd. detachable Dempster-Dumpster Containers . . . payloads up to 19 tons. Savings are tremendous! Take advantage of our free engineering service, which determines by fact-finding survey the cost cutting possibilities of this system in your plant. Dempster Brothers, Inc.

600 Gal. stainclad tank with brine cooling channels.

A Container available up to 10 cu. yds. with or without lids for many uses.

A 9 cu. yd. container for handling packaged products.

BROTHERS 256 N. KNOX, KNOXVILLE 17, TENNESSEE

on central steel cage column, resting on machinery base. All levers are supported by this single support unit with pendulum mechanism fastened to the column top. Construction insures against misalignment of weighing components due to accidental bumping or denting of the cabinet.

Dials are equipped with shock absorber and oscillation damper that automatically adjust to provide exact amount of impedence necessary to counteract shocks coming from scale platform. In operation when load is dropped on scale, mechanism first absorbs shock and then allows indicator to move to proper weight. Optional equipment includes printer, double-face dials, counting attachments, remote-reading equipment, semi-automatic drop weights, air-operated or mercoid switches and accumulating ring.

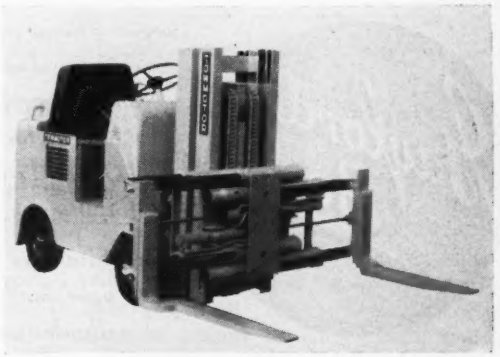
(Floaxial cabinet dial scales are manufactured by Fairbanks, Morse & Company, Dept. CP, 600 S. Michigan Ave., Chicago, Ill. . . . or for more information check CP 5388 opposite last page.)

Handles wide range of pallets — odd-shaped loads . . .

unit combines function of lift truck and clamp truck

Uses: Designed for operations where truck must double as fork truck and clamp truck, unit handles any width pallet or odd-shaped loads.

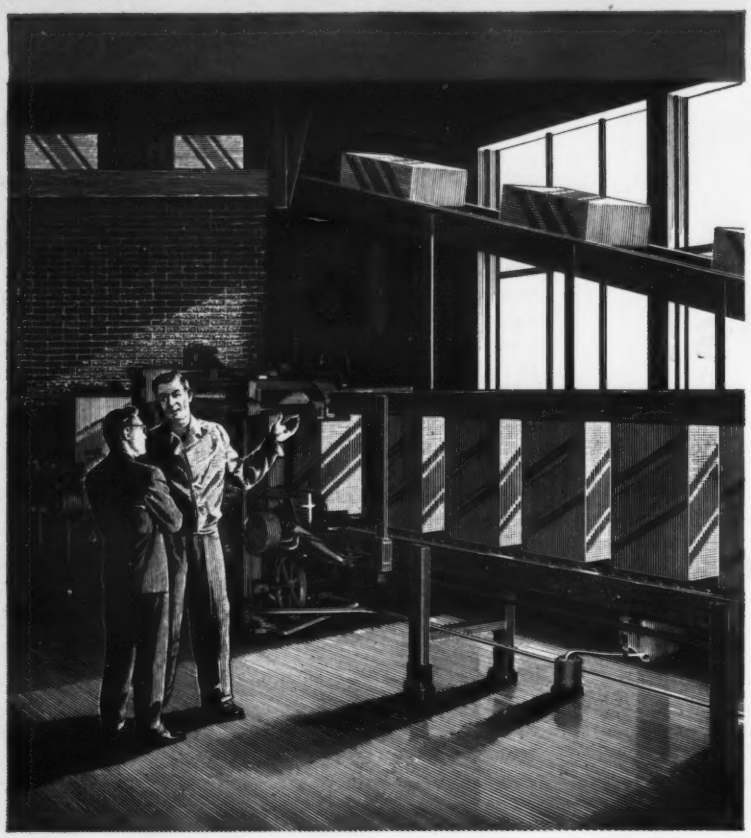
Features: Fork span is quickly adjusted through hydraulic actuation of clamping mechanism.



Unit is designed for operations where truck must double as clamp truck and lift truck

Description: Multi-purpose unit requires no changeover from one function to the other. Clamping is accomplished by inner edges of forks.

(Hydraulic clamp and offset fork attachment is manufactured by Towmotor Corp., Dept. CP, 1226 E. 152nd St., Cleveland 10, Ohio . . . or for more information check CP 5389 opposite last page.)



WHAT PRICE INTERRUPTIONS?

Profitable use of modern high-speed filling, packing and closing machinery depends on operation without interruptions. A single "off-size" box can halt production. That's why Gaylord's quality control and uniformity are so important.

For containers that will work best with your modern equipment . . . specially designed, if necessary, to suit your specific needs . . . call your nearby Gaylord office.

Gaylord Boxes

CORRUGATED AND SOLID FIBRE BOXES
FOLDING CARTONS • KRAFT PAPER AND SPECIALTIES
KRAFT BAGS AND SACKS

GAYLORD CONTAINER CORPORATION ★ ST. LOUIS
DIVISION OF CROWN ZELLERBACH CORPORATION

When inquiring check CP 5390 opposite last page

Handles burdens heavier than its own weight . . .

mobile aluminum unit available in 12, 16, and 20-foot lengths

Uses: Unit is designed as booster for gravity conveyor lines, truck loading and unloading, and floor-to-floor operations in warehouse or plant.

Features: Aluminum channel frame enables unit to handle pieces heavier than its own weight.

Description: Staggered, hard maple rollers with self-lubricating bearings support 12"-wide rubber covered belts, driven by powered roller chain. Unit is powered by 1/3 hp, 115v, single-phase motor with reversing drum control and power drive, gear reduction unit. If required, power unit can be re-

Unit is powered by ⅓ hp 115v, single-phase motor

moved in a matter of seconds. No pulley adjustments are required at either end of the conveyor. Belt guide keeps belt centered at all times and eliminates problem of belt run-off. Unit is available in 12, 16, and 20-foot lengths.

("Ve-Be-Veyor" Conveyor is manufactured by A. B. Farquhar Div., The Oliver Corporation, Dept. CP, 102 N. Duke St., York, Pa. . . . or for more information check CP 5391 on form opposite last page.)

Describes construction for pneumatic fittings

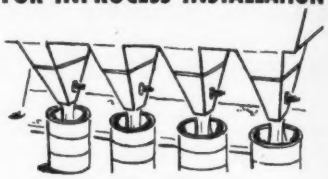
Illustrated data sheet explains reversible fittings to stand impact and wearing in pneumatic conveying systems. Details of installation and size specifications are included.

Data Sheet Wb is issued by The Allen-Sherman-Hoff Co., Dept. CP, 259 E. Lancaster Ave., Wynnewood, Pa. When inquiring specify CP 5392 on form opposite last page.

DON'T GET Hung-up
THERE IS A Cleveland Vibrator

FOR INCOMING RAW MATERIALS

FOR INPROCESS INSTALLATION



FOR PACKAGING

and for all other bin applications in the handling of dry or viscous chemicals. Prevents bridging, plugging and arching — keeps chemicals moving — eliminates processing delays.

Write today for literature and engineering details.

Air or Electric
Portable or Permanent
Silent or Standard

Bin Stuck Lately?
THE CLEVELAND VIBRATOR COMPANY
2706 Clinton Avenue • Cleveland 13, Ohio

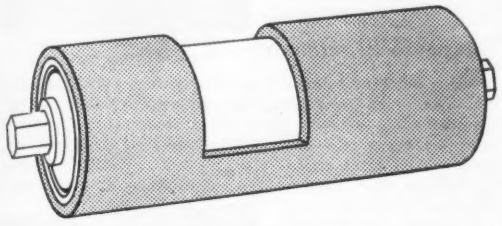
When inquiring check CP 5393 opposite last page

Coverings provide cushioning on conveyor rollers . . .

application, in liquid form, is unaffected by roller's size or shape

Uses: Neoplastic-covered conveyor rollers are designed for applications where cushioning effect is required or where extreme care of articles to be handled is required.

Features: Covering is applied in liquid form, hence its application is unaffected by size or shape



Thickness of covering normally ranges from ⅛" on smaller rolls to ¼" on larger sizes

of conveyor roller. Rollers can be furnished in any length straight face, also concave and tapered types.

Description: Thickness of covering varies with length of time part is dipped and gage of metal. Thicknesses normally range from ⅛" on smaller rolls to ¼" on larger sizes. For special applications additional thickness is available.

Qualities of Neoplastic are similar to neoprene. Material is resistant to abrasion and not affected by steam, hot or cold water, oil, grease, alkalis, acids, salts, or inorganic acids. Material has durometer hardness Shore A2 of 70-75 and will withstand temperatures up to 200°F. Neoplastic-covered wheels for wheel conveyors in all standard sizes are also available.

(Covered rollers and wheels are products of Logan Company, Dept. CP, 215 Cabel St., Louisville 6, Kentucky . . . or for more information check CP 5394 on form opposite last page.)

Shows hanging magnet for tramp iron

Two-color bulletin of four pages shows magnet to be hung over belt pulleys or belt web. Tramp iron removal at effective ranges to 19 inches from magnet face is specified. Model numbers are related to belt speeds, magnet range, and size.

Cat 114 is issued by The Ohio Electric Mfg. Co., Dept. CP, 5400 Dunham Road, Maple Heights, Cleveland, Ohio. When inquiring specify CP 5395 on form opposite last page.

Plastics Engineering Co., Sheboygan, Wisconsin, operates two fire-safe Allis-Chalmers fork trucks. One works in the kettle room where alcohol fumes are a hazard. The other moves material in the grinding room where there is danger of dust explosion.

when the sign says FLAMMABLE

. . . better play it safe with Allis-Chalmers safety diesel trucks

In many plants, the very atmosphere is explosive because of dust or fumes. A single spark can touch off disastrous fires. While conditions like this call for the utmost care, the need remains for efficient material handling.

To meet this need, Allis-Chalmers has developed a Safety Diesel Fork Truck especially for hazardous areas. It runs on low-volatile fuel and requires no electrical system. The starter is hydraulic, gauges are mechanical, the horn is air-operated. As further precautions, surfaces of the manifold and muffler are water-cooled, exhaust gases pass through a water quench, tires are grounded — the forks may be spark-proof manganese bronze.

These fork trucks are approved by the Mill Mutual Fire Prevention Bureau, and are in use at a rapidly growing number of plants where explosive conditions exist. Whether you need fire-proofed safety or unmatched material handling efficiency, you'll find an Allis-Chalmers fork lift truck is your wise choice. Write for literature, or get all the facts from your Allis-Chalmers Buda Division dealer.

ALLIS-CHALMERS, BUDA DIVISION, MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS

BH-9

When inquiring check CP 5396 opposite last page

Reclaiming Triple Superphosphate to Hopper

How Sauerman Scraper Storage Reduces Costs

Overall View of Storage

200,000 tons of triple superphosphate are produced each year in this new Florida plant. It is delivered by overhead conveyor to a 329'x146' storage building of 35,000 ton capacity. The material is then stockpiled and reclaimed by a 2½ cu. yd. Sauerman Scraper at a rate of 150 tph.

Here's how a Sauerman Machine cuts costs:

One operator, located in a safe station overseeing the entire area, can recover practically 100% of all stockpiled material.

All highly machined parts, hoists and motors can be located outside of the building and protected from corrosion and dust.

When parts are replaced—sheaves, clutch or brake linings—the machine is restored to practically new condition, even though it may be twenty or more years old.

Only the Crescent scraper and cables contact the material. The scraper machine can be designed to operate the scraper on top of non-caving material. This allows the scraper to break down any high faces that may be standing.

Sauerman Storage Machines are built for hourly capacities of from 20 to 600 cu. yds. A partial list of chemical producers and manufacturers using some type of Sauerman equipment includes:

Consumers Cooperative Assn.
Crawford Chemical Co.
Davison Chemical Co.
Division of W. R. Grace & Co.
Duval Sulphur & Potash Co.
F. S. Royster Guano Co.
International Minerals & Chemical Corp.
Lion Oil Co.
Potash Company of America
Tennessee Farmers Cooperative
Virginia-Carolina Chemical Corp.
Southern Agricultural Fertilizer Co.

For ways to reduce your material handling costs, write to Sauerman's experienced engineers. Request Catalog MMM-2 Chemicals Handling & Storage and field reports on the handling of your material by Sauerman Machines.

SAUERMAN BROS. INC. 624 S. 28th Ave. • Bellwood, Illinois

When inquiring check CP 5397 opposite last page

MATERIAL HANDLING

Added wear provided by reversible wear-back

Uses: Impact fittings are designed to provide low friction loss in pneumatic-handling systems.

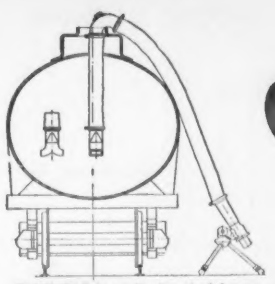
Features: Separate, reversible wear-back, bolted to body of fitting, increases life of fitting. Wear-back provides higher abrasion-resistance (Brinell hardness: 550) than body. Back can be reversed to distribute wear.

Reversible wear-back extends life

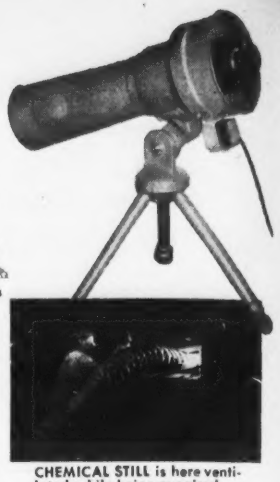
Description: Fitting bodies are cast of chrome-iron alloy with Brinell hardness of 340 to 360. Discharge end of fitting is extended to remove pipe connection as far as possible from eddies created by the turn — reducing wear at connection. Fittings are cast with plain ends and are connected to straight pipe sections with sleeve couplings. Adaptors are available for connection to flanged pipe or flanged connections on equipment.

Line includes 45 and 90-degree elbows and 45-degree lateral fitting in 4, 5, 6, and 8" sizes. Wear-backs are interchangeable for all types in the same size. Thickness of back increases with fitting size.

(Line of fittings is manufactured by Allen-Sherman-Hoff Co., Dept. CP, 259 E. Lancaster Ave., Wynewood, Pa. Check CP 5398 on form opposite last page.)



TANK CAR is easily freed of fumes for workers' safety.



CHEMICAL STILL is here ventilated while being repaired.

KEEP AIR FRESH

in confined places with COPPUS *Design "A" Ventilator*

Improve workers' safety—health—comfort—efficiency. Get rid of dangerous gases, fumes, stagnant air. Coppus Design "A" Ventilator ventilates tanks, tank cars, drums, vats, underground cable manholes, pipe galleries, airplane wing compartments, fuselages. For complete information, write Coppus Engineering Corporation, 385 Park Ave., Worcester 2, Mass. Sales Offices in *Thomas' Register.*

Other "Blue Ribbon" Products in *Chemical Engineering Catalog, Refinery Catalog, Best's Safety Directory* and *Mining Catalogs.*

ANOTHER COPPUS "BLUE RIBBON" PRODUCT

When inquiring check CP 5399 opposite last page

IMPORTANT SAFETY for your plant!

Slip-resistant

Tri-Lok and Tri-Forged

Serrated grating and stair treads

Don't take chances in those plant areas where grease, oil or other conditions make floors slippery and dangerous! Play it safe with the non-skid, notched surface of *Tri-Lok* or *Tri-Forged* serrated grating and stair treads. Here is a walking surface that is hazard-proof and the ultimate in safety. To be sure you have complete information on all *Tri-Lok* and *Tri-Forged* products, write today.

For free catalog write Department D-2705

DRAVO CORPORATION
Pittsburgh 22, Penna.
National Distributors

When inquiring check CP 5400 opposite last page

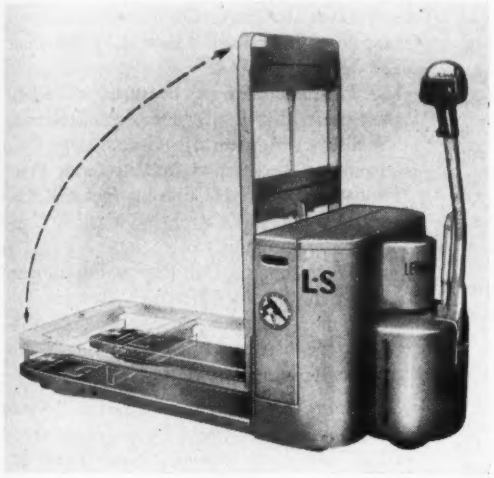
Handle platform skids, pallets, with single unit . . .

electric walkie truck is available in capacities to three tons

Uses: One-man handling of palletized materials in areas with smooth floors.

Features: Hinged superframe permits handling of single- or double-faced pallets, or skid platforms. Truck has vertical lift of 4" — handles skids of any under-clearance.

Description: Unit has double reduction gear drive with traction speeds of 3 mph empty and 2.3 mph loaded. All controls for forward and



Superframe permits handling of single-faced or double-faced pallets, or skid platforms

reverse speeds, brake, lifting and lowering, are located in handle head. Truck is available in capacities to 6000 lb.

(Jacklift electric pallet truck with hinged superframe is product of Lewis-Shepard Products, Inc., Dept. CP, Watertown, Mass. . . . or for more information check CP 5401 on form which is located opposite last page.)

Scales for heavy duty grouped in bulletin

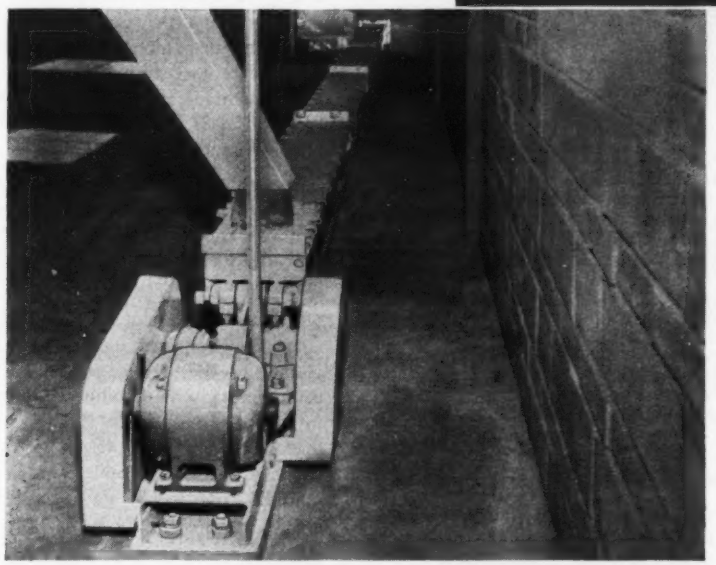
Printed in two colors, six-page bulletin describes three models of heavy-duty bulk scales. It explains materials which can be handled, shows feeding arrangements, special features, and accessory equipment. A list of more than 120 materials now handled by these scales is included.

Bul 8946A is issued by Richardson Scale Co., Dept. CP, Van Houten Ave., Clifton, N. J. When inquiring specify CP 5402 opposite last page.

Link-Belt Flexmount Oscillating Conveyors

stocked locally . . .

LINK-BELT FLEXMOUNT OSCILLATING CONVEYORS are pre-engineered—can be bought direct from your local Link-Belt outlet. Standard sections of 8, 12 and 18-in. widths make selection easy . . . assembly simple. Heavy-duty 36-in. wide units are also stocked.



installed quickly . . .

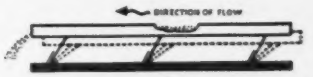
FLEXMOUNT OSCILLATING CONVEYOR at midwest milling firm keeps material moving in even flow regardless of surges. These conveyors can be furnished with: stainless steel or galvanized troughs . . . dividers to handle several materials simultaneously . . . jacketed trough for heating or cooling en route. Ideal for handling material where cleanliness, contamination or corrosion are factors.

If you need a conveyor for moving granular or lumpy, hot or cold, corrosive or abrasive materials — and need it NOW—investigate Link-Belt Flexmount Oscillating Conveyors. They're available from stock in pre-engineered sub-assemblies for conveyors up to 100-ft. long.

Flexmount is easily and quickly installed, simple in design, and requires minimum of space. Continuous, leak-proof, self-cleaning metal trough is supported on sturdy, resilient legs. Heavy-duty, sealed roller bearings in drive need only periodic lubrication.

See this versatile conveyor at your nearby Link-Belt factory branch store or authorized stock-carrying distributor. Call him today or write for Book 2478.

How Positive Action moves material



Positive-action, constant-stroke eccentric provides a powerful, yet gentle upward and forward oscillating motion. Large volumes of material are moved in a uniform, continuous flow, regardless of surges. Resonant spring action of resilient legs cuts power requirements to a minimum.

LINK-BELT

FLEXMOUNT OSCILLATING CONVEYORS

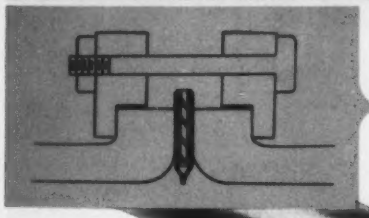
LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office: New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 13,987

When inquiring check CP 5403 opposite last page

CHEMISEAL GASKETS

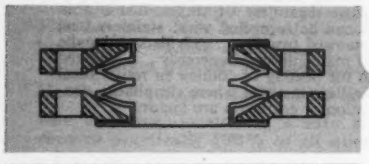
made of du Pont TEFLON

and accessories for chemical piping

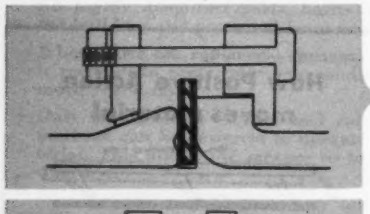


Chemiseal Jacketed Gasket, Type 1-339 WA. Compressed asbestos sandwiched between woven asbestos and enclosed in a Teflon envelope. Ideal for glass-lined steel connection. Catalog No. TG-953.

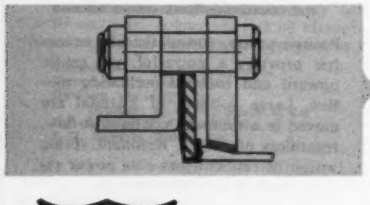
Chemiseal Snap-on Type 820 Gaskets. Molded to match contour of conical-end glass pipe, they assure perfect automatic centering of joints and free flow of medium. Made for all standard pipe sizes from ¼ in. to 6 in. Catalog No. TG-953.



Chemiseal Expansion Joints, No. 212, and Flexible Couplings, No. 202, absorb shock and vibration, thermal expansion and contraction. Correct misalignment. Connect unlike piping ends and nozzles. Catalog No. EJ-1155.



Chemiseal Adaptors No. 2-CRS, provide a tight, safe seal between unlike piping ends and nozzles. A steel bearing ring provides rigidity. Resilient core assures safe seal at low bolt loads. Teflon Jacket protects and contains easy-to-handle single unit. Catalog No. TG-953.



Chemiseal Reducers No. 3-CRS are one piece assemblies similar to type 2-CRS, but designed to connect unlike pipe sizes with minimum length requirements. Standard sizes from 1 in. to 6 in. Bulletin No. 3-CRS.

Ask your U.S. Gasket—Belmont Packing Distributor or write for literature.

UNITED STATES GASKET CO.
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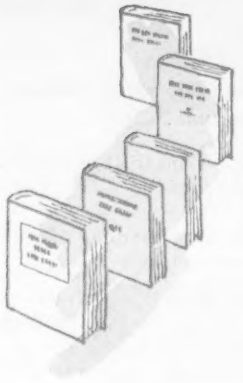
Recent Books



The Petroleum Acids and Bases

Doctors H. L. Lochte, professor of chemistry at the University of Texas, and E. R. Littmann of the Enjay Company have collaborated on this monograph describing the acids and bases found in petroleum. The acids include aliphatic, naphthenic, and aromatic acids, and phenols; the bases are nitrogen-containing compounds.

Although they comprise less than 3% of most crudes, there are many different compounds. Their separation and identification is made difficult because there are so many homologues and isomers.

Uses for the compounds, methods of separation and analysis, and characteristics are given in the 368-page book. Pertinent patents are given and bibliographies included in most of the sixteen chapters. Especially thorough patent reviews are given in those chapters describing applications of the compounds. Book is 5½ x 9 inches in size.

To obtain "The Petroleum Acids and Bases" remit $9.00 *direct to The Chemical Publishing Co., Inc., Dept. CP,* 212 *Fifth Ave., New York* 10, *N.Y. When inquiring specify CP* 5405 *on form opposite last page.*

Distillation in Practice

"Distillation in Practice", edited by the late Charles H. Nielsen, Research Supervisor, E. I. du Pont de Nemours & Co., is a collection of papers originally presented in Philadelphia, Pa., in May, 1954, under the auspices of the Philadelphia-Wilmington Section of the AIChE and the Department of Chemical Engineering, University of Pennsylvania. Book's primary objective is to bring to younger chemical engineers the practical engineering experience of successful men in industry.

Papers and authors included in the 133-page book are:

1) Over-all Tower Design from a Process Viewpoint, by C. Pyle, E. I. du Pont de Nemours & Co.
2) Physical Design Features of Plate Columns, by R. L. Geddes, Stone & Webster Engineering Corp.
3) Some Techniques in Petroleum Fractionation, by C. H. Brooks, Sun Oil Co.
4) Distillation Control, by Ward O'Connor, The Lummus Co.
5) Operation of Distillation Equipment, by C. E. Strong, Hercules Powder Co.
6) Some Commercial Aspects of Vacuum Distillation, by W. A. Hall, Atlantic Refining Co.

To obtain "Distillation in Practice" remit $3.00 *direct to Reinhold Publishing Corporation,* 430 *Park Avenue, New York* 22, *N. Y.*

Chemical Pilot Plant Practices

As pointed out in the preface of this book, pilot plants perform a variety of services in the chemical industry, but the nature of these is often misunderstood. Although only a relatively short book (152 pages), D. G. Jordan's "Chemical Pilot Plant Practices" gives even the beginner a pretty good idea as to the "whys and wherefores" of pilot plants.

Well-written and easy-to-read, individual chapters are as follows: 1) General Considerations, 2) The Scale-up Problem, 3) The Handling of Solids, Liquids, and Gases, 4) Chemical Reactors, 5) Separation Processes, 6) Cost Estimation and Report Writing. For those seeking additional information, there is a list of 42 literature references included at the end of the book.

A considerable number of pages are devoted

reviews of current technical and reference works . . . summarized for you by authorities in the field working with the CP staff

to the subject of manpower. Author points out that the largest portion of the cost of pilot plant work is in wages and salaries. He emphasizes that this cost in manpower must be accepted and the fact recognized that the rate of production of data and product from a given unit will depend very heavily on the quality and quantity of the personnel.

To obtain "Chemical Pilot Plant Practice" remit $3.50 direct to Interscience Publishers, Inc., Dept. CP, 250 Fifth Avenue, New York 1, New York. When inquiring specify CP 5406 on form opposite last page.

New Methods in Analytical Chemistry

Reviewed by DANA S. DAVIS
Miami University, Oxford, Ohio

The need for a single book that would contain a variety of alternative analytical procedures prompted Ronald Belcher, University of Birmingham, and Cecil L. Wilson, Queen's University of Belfast, to compile this 287-page reference work. Wherever possible they follow a set pattern for the development of quantitative techniques that are classical rather than instrumental. In excellent form, each method is preceded by a discussion of the important properties of the reagents, of the resulting compounds, or of related materials, and is followed by helpful literature references, many of which are American. Ample space is given to details of the suggested procedures, discussion of interfering ions, and statements of unusual conditions.

A leisurely but informative preface sets the stage for chapters that are devoted to separation by precipitation; separation by extraction; multipurpose and selective inorganic precipitants; twenty-four organic reagents; acid-base, redox, iodometric, adsorption, and miscellaneous indicators; eight titrants; and twenty-four miscellaneous methods. Boldface and italic headings and subheading guide the reader, who will not find the book too British for American taste, from preface to author and subject indexes through reliably tested analytical methods, many of which make their first appearance in book form.

Numerous gravimetric and titrimetric factors, unusually complete coverage of indicators, well-organized tables, clear structural formulas, terse English, and lucid expression should make many American friends for this book, which was printed in Great Britain.

To obtain "New Methods in Analytical Chemistry" remit $5.50 direct to Reinhold Publishing Corp., Dept. CP, 430 Park Ave., New York 22, N. Y.

Revised Lefax

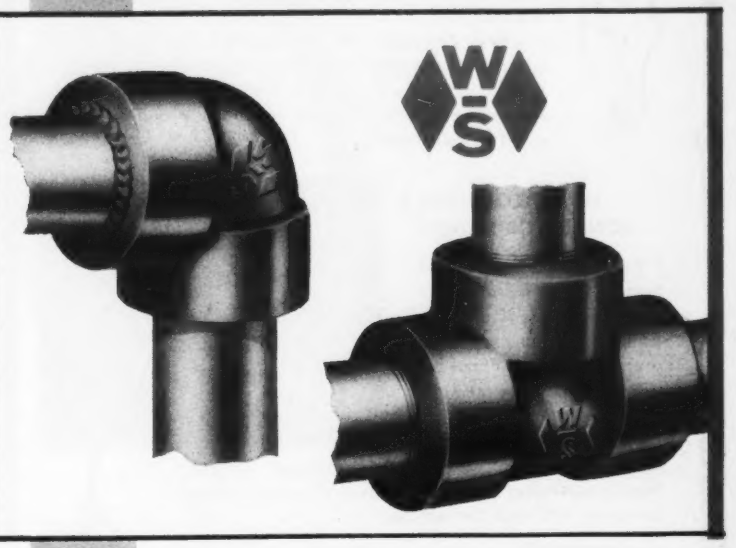
Most technical people are familiar with Lefax reference books and will be at home with these recent editions. Handy pocket size (4 x 7") is retained. Much of the material is retained from earlier versions — though new data on current advances have been added. Average volume runs about 140 pages.

While an extremely wide range of technical subjects are covered by these books, those most likely to interest chemical people are piping data, analytical chemistry, chemical tables, general chemistry, industrial chemistry, physical and organic chemistry, and mathematical conversion factor tables.

Listed under chemical engineering, one sec-

(Please turn to next page)

2 Safe Ways to PROTECT Pressure Piping...



W-S SCREW-END and SOCKET-WELDING FORGED STEEL FITTINGS

Pipe joints are potential trouble spots in high pressure piping systems. Change in direction of flow causes turbulence, erosion and vibration. Watson-Stillman fittings are made to absorb this type of punishment. They're drop-forged for strength and toughness and safety-factor designed for the protection of your piping.

Choose between a welded piping system and a screwed one to suit your needs. Then choose W-S Screw-End or Socket-Welding Fittings to join your pipe. They're available in sizes ⅛" to 4" for piping up to 6000 lb. W.O.G. class. For high temperature or corrosive service you can get W-S Forged Stainless and Alloy Steel Fittings, too. Send today for our informative catalogs.

W-S FITTINGS DIVISION

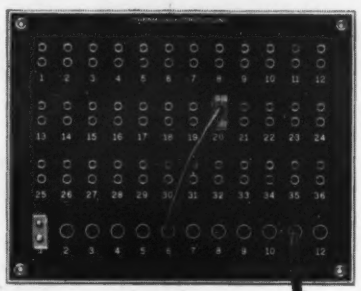
H. K. PORTER COMPANY, INC.
Roselle, New Jersey

When inquiring check CP 5407 opposite last page

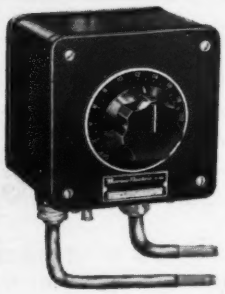
SWITCHING MANY THERMOCOUPLE OR RESISTANCE BULB CIRCUITS?

Temperature measuring applications are like tracks in a freight yard—they often need plenty of quick switching. Achieving both measuring accuracy and speed — especially with frequent switching — requires a system well suited to the individual circuit. Among Thermo Electric's four methods is one best suited to *your* needs.

QUICK-COUPLING CONNECTOR PANELS



Provide great flexibility for transferring numerous thermocouples—ideal for patch panel use. Many compact shapes and sizes. Panel for 48 thermocouples and 16 pyrometers measures only 13¼ x 7⅞". Polarized plugs and jacks of standard thermocouple materials have long-wiping surfaces and spring loaded contacts for good electrical connections.



ROTARY SELECTOR SWITCH

For quick checking or switching of thermocouples or resistance bulbs. "Shorting-type" switches designed for flush panel or wall mounting. Contacts and wipers of same silver alloy. Three models have OFF to 6, 12 and 24 points.

KEY SWITCHES

Provide a choice of connecting many sensing elements to one instrument or transferring sensing elements from one type of instrument to another. Locking or non-locking construction.

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For on-off checking of temperatures from many points or averaging any number of temperatures on one indicator.

Single Case Construction | 12-72 points for push buttons, 12-144 for keys.

Write for Bulletins | Connector Panels No. 23-R; Rotary Switches No. 24-100-R; Key and Push-Button Switches No. 24-1-R

Thermo Electric Co., Inc.

SADDLE BROOK, NEW JERSEY

In Canada — THERMO ELECTRIC (Canada) Ltd., Brampton, Ontario

When inquiring check CP 5408 opposite last page

Recent Books

(Continued from preceding page)

tion of data sheets is divided into four parts. These treat air and gases, flow of liquids, heat transfer, and unit operations. A 22-page corrosion supplement is also available.

One advantage of the Lefax scheme, of course, lies in making up loose leaf booklets containing data pertinent to problems at hand and containing no "waste" information. For this reason most readers will want to consult the catalog of available material.

To obtain any Lefax book, remit $1.25 *direct to Lefax, Dept. CP, 9th and Sansom Sts., Philadelphia* 7, *Pa. Other parts, sections, special graph sheets, tables, etc. are priced variously and can be procured as desired from catalog listings . . . or for more information check CP* 5409 *on form opposite last page.*

Chemical Engineering Unit Operations Vol II

This second volume, on chemical engineering unit operations by J.M. Coulson and J.F. Richardson, deals with the wide applicability of the fundamental principles of momentum, heat, and mass transfer. Only physical operations are considered, with chemical reaction kinetics not included.

Although basic principles are stressed, indication is given of empirical design techniques where the basic mechanism is not sufficiently understood. Included are various methods for calculating the number of plates required in a distillation column, the number of stages for liquid-liquid extraction, and others.

Equipment for performing the various operations discussed is treated clearly. Photographs, engineernig drawings, and cutaway views illustrate operating principles and construction details of distillation columns, filters, centrifuges, classifiers, separators, extractors, and dryers.

Examples of the application of the theory are included, wherever appropriate, to aid in illustration. A selection of problems to be worked separately is given. Work can be used either as a text or reference for chemical engineering plant design in industry.

To obtain "Chemical Engineering, Unit Operations, Vol. II" remit $9.00 *direct to McGraw Hill Book Co., Inc., 330 W. 42nd St., New York* 36, *N.Y.*

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Here is an easy-to-install flowmeter . . . free of all conventional service requirements . . . giving long-term economy as well as low initial cost. There are no pressure tight bearings . . . no magnetic followers . . . no stuffing boxes . . . no hysteresis problems whatsoever. No calibration is ever required, yet you have the highest accuracy available.

★ High operating pressures
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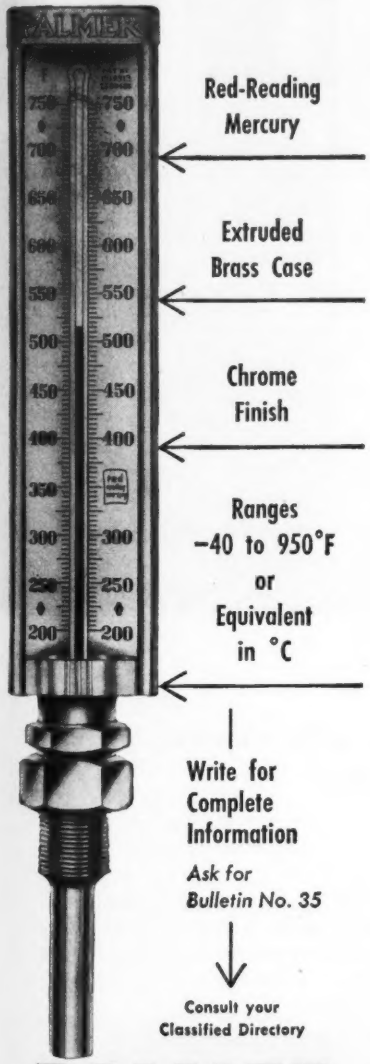
RED-READING MERCURY THERMOMETERS



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Consult your Classified Directory

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THERMOMETERS, INC.
Mfrs. of Industrial Laboratory, Recording and Dial Thermometers
Cincinnati 12, O.

When inquiring check CP 5411 opposite last page

Recent Books

Process Engineering Economics

Reviewed by D. S. DAVIS
Professor of Chemical Engineering
Virginia Polytechnic Institute

In 397 pages packed with practical information and fortified with 54 figures, Herbert E. Schweyer of the University of Florida, has made a distinct contribution to the McGraw-Hill chemical engineering series. The book presents fundamental accounting and sound economic procedures which are applied on the spot to problems that confront process engineers daily.

Twelve chapters of consistently high quality deal with introductory matter: value of money, amortization, capital requirements for process plants; costs, earnings, profits, and returns; economics of selecting alternates; rate of return and payout time; economic balance in general, in cyclic operations, in yield and recovery, and in process operations; and economic analysis of complete processes. Fifty-seven detailed illustrative examples and 189 lively problems that add value to the expository matter provide ample measures of assistance.

Professor Schweyer, who doesn't hesitate to introduce a little elementary calculus where it will do the most good, has thoughtfully added an appendix that includes tables of factors of compound interest and present worth.

To obtain "Process Engineering Economics" remit $7.50 direct to the McGraw-Hill Book Co., Dept. CP, 330 West 42nd St., New York 36, N. Y.

Mass Transfer Operations

Designed to serve as an advanced textbook and to narrow the gap between current practice and that taught in university courses, this 666-page book by Robert E. Treybal introduces the reader to the general features of diffusion and techniques used in industrial applications of the mass transfer operations. It is not meant for the novice. The presentation assumes that the reader has elementary knowledge of fluid flow and heat transfer, as well as of calculation of material and energy balances and the use of the ideal-gas laws.

To obtain "Mass Transfer Operations" remit $9.50 direct to McGraw-Hill Book Company, Inc., 330 West 42nd Street, New York 36, N. Y.

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SEGMENT—stainless steel, with nylon-faced gear section. Nylon-to-metal bond stabilizes the nylon against expansion and contraction . . . maintains accurate pitch diameter . . . assures proper mesh with stainless steel pinion under severe temperature and moisture conditions.

MONO-UNIT CONSTRUCTION—permits easy removal of complete gauge assembly for inspection and adjustment.

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MICROMETER ADJUSTABLE SELF-LOCKING POINTER—permits accurate repositioning of pointer.

These features are also available in USG Solfrunt Gauges with solid front construction.

Supergauges available in 4½", 6", and 8½" sizes. For complete information on case styles, materials of construction and connections write for Publication 1819.

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When inquiring check CP 5412 opposite last page

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- ✔ Unrestricted, Instantaneous Opening In Sizes 1" Through 36".
- ✔ Greater Safety — Operates Closer To Disc Rupture Pressure.
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- **Alternating Pressure and Vacuum**
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Utilize Our Research Facilities In Selecting Model DV Discs For "Tough" Applications.

BLACK, SIVALLS & BRYSON, INC.

Safety Head Division, Dept. 2-M5
7500 East 12th Street Kansas City 26, Missouri

When inquiring check CP 5413 opposite last page

For safety's sake, positive exhausters pull corrosive fumes and solvent vapors directly from reaction vessels to . . .

eliminate explosive combinations

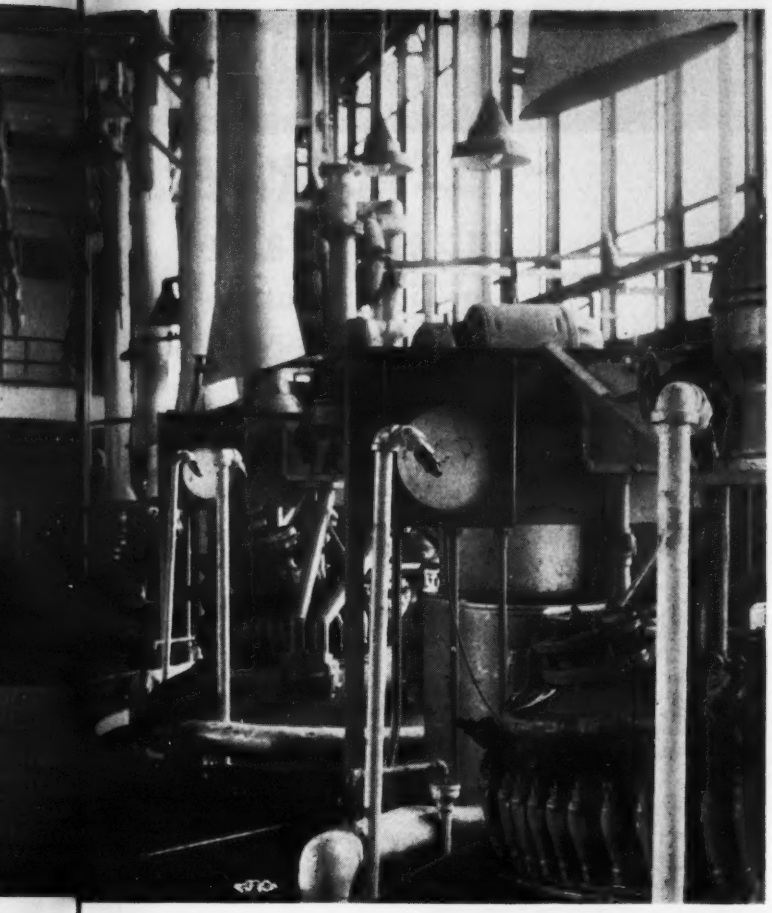
. . . of fumes from nitric acid, sulfur dioxide, benzene, ethyl alcohol

WILLIAM C. CLARKE, Assistant Editor
With **CARL SEVELAND,** Chemical Engineer
G. D. Searle and Company
Skokie, Illinois

Problem: Volatile solvents and corrosive vapors must be exhausted from reaction vessels by chemical manufacturing division of G. D. Searle & Company in Skokie, Illinois, to eliminate explosive combinations, remove any danger of inhalation by personnel, protect equipment from corrosive fumes. Vapors include nitric acid, sulfur dioxide, ammonia, benzene, ethyl alcohol, ethyl acetate.

Desiring local exhaust ventilation, Searle faced two more problems. Effectiveness of a duct system would be hampered by closures of pressure vessels. Corrosive vapors and volatile solvents could easily destroy motor windings in the power exhausters — particularly when fumes exhausted include nitric acid.

Solution: Using individual power exhausters with telescoping ducts, Searle installed an exhaust system to pull corrosive fumes and solvent vapors directly from reaction vessels. Canopy-style hood of duct is lowered to vent gases when reactor vessel is open. Power exhauster, located on roof of building, draws fresh, clean air through hood to create an air curtain around vessel opening. Fumes are prevented from entering into the operating area and are discharged to the outer atmosphere. After reaction vessel is vented, telescoping duct is raised to per-



Telescoping ducts are lowered to remove fumes from reaction vessels. Power exhausters on roof provide "pull"
CP Staff Photo

mit the operator to observe contents and to wash down the vessel after pumping out.

With power exhaust fans located on roof directly over reaction vessels, an individual fan is used for each exhaust. Despite corrosive vapors and volatile solvents, protection for motor is provided by a patented air seal-off. Fresh, clean air is drawn into the motor housing from above the motor under constant negative pressure so that contaminated air from below cannot enter the housing while the unit is in operation. Air stream flow eliminates necessity for special explosion-proof motors. Positive air expulsion is provided by squirrel-cage fan driven by a direct-drive

(*Please turn to page* 143)

CP Staff Photo
Chemical Engineer, Carl Seveland of G. D. Searle and Company, examines power exhauster on roof

NEW CHEMICALS . . . NEW METALS . . .
NEW MACHINERY . . .
NEW PROCESSES
NEW FIRE HAZARDS
FIRE-FOG
AIR FOAM
"Automatic" SPRAY Sprinkler
At "Automatic" Sprinkler we've kept abreast of technological advancements and the effect of such progress in terms of fire safety for every business. In short, we either have the answer to your fire protection problem or our technicians will get it for you.
Send for Bulletin 73 - Engineered SPECIAL HAZARD Fire Protection
HIGH PRESSURE CO_2
LOW PRESSURE CO_2
DRY CHEMICAL
"Automatic" Sprinkler
CORPORATION OF AMERICA
YOUNGSTOWN, OHIO
Offices in Principal Cities of North and South America

When inquiring check CP 5414 opposite last page

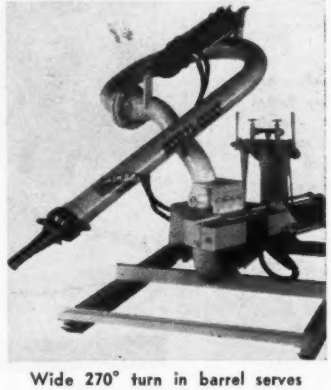
Monitor is controlled by hydraulic pressure . . .

device covers horizontal pattern of 270°

Uses: Fire monitor discharges 2000 gallons per minute through 2½" tip. Unit has effective striking range of 300 feet.

Features: Monitor is operated by hydraulic pistons with power from diverted water pressure or may be manually operated when pistons are removed.

Description: Unit discharges water, foam, or chemicals. Stream can cover horizontal pattern of 270° and vertical pattern of 120°.



Wide 270° turn in barrel serves to balance vector forces

Pressure range is 30 to 300 psi. With hydraulic pistons removed, unit can be controlled with one hand. Stability results from 270° turn in barrel which serves to balance vector forces. Wide turn also minimizes friction loss and uses maximum available pump pressure.

Multiple intakes of 2½ or 3½" hose can be adapted to the 4" supplied pipe. Control valves and levers may be removed to a safe distance from fire for remote operation.

(Intelli-Giant MH-4 is manufactured by Chiksan Company, Div. of Food Machinery and Chemical Corp., Dept. CP, 332 Pomona Ave., Brea, Calif. . . . or for more information reader may simply check CP 5416 on form which is located opposite last page.)

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New Stanzoil
Neoprene Coated Flannel
Industrial Gloves

15 Design Innovations Justify This Statement:

"One test on YOUR job can save you thousands of glove dollars"

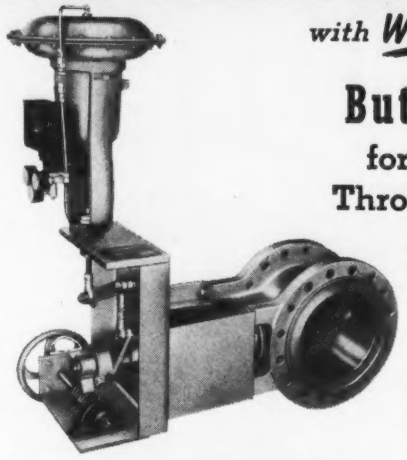
Knit wrist, 12", 14½" and 18" Gauntlet styles available in Light, Industrial and Heavy Duty weights from leading distributors. Test samples on request from . . .

the PIONEER Rubber Company
241 Tiffin Road, Willard, Ohio

Pioneers in Industrial Hand Protection for over 35 Years

When inquiring check CP 5415 opposite last page

Meet Any Flow Conditions
of Pressure · Temperature · Corrosion



12" stainless steel valve for hot gas at 265 p.s.i.; has automatic air operator, auxiliary hand wheel and valve disc positioner.

with **W.S. ROCKWELL**
Butterfly Valves
for Tight Shutoff—Throttling—Regulating

Minimum pressure drop • Self-cleaning • Compact • Lighter weight • Less space • Easy to install.

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FURNACES • OVENS • BURNERS • VALVES • SPECIAL MACHINERY
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Sales Representatives in Principal Cities

When inquiring check CP 5417 opposite last page

NOW
a single, central instrument instantly reads temperatures at up to 23 locations
WEST MULTI-POINT
HIGH RESISTANCE INDICATING PYROMETERS

Pilot plants, laboratories, power plants, ships and industrial processors are using this efficient and economical method. A Veri-Tell pyrometer, selector switch and terminal panel (plus thermocouples and leads) comprise the unit. Wide selection of scales and ranges. Where thermocouple leads must be of different lengths, calibrating spools may be added.

MODEL IN
Series #3-5-11-17-23 Position, less thermocouples and leads*, $95-$135.

MODEL ISN
Series as above with reference setting.

THERMOCOUPLE SWITCHES
for use with existing instruments.

FREE—bulletin IN-1 available on request.

WEST Instrument CORPORATION
CHICAGO
SALES OFFICES IN PRINCIPAL CITIES

4357C W. MONTROSE AVE.
CHICAGO 41, ILLINOIS

*Write for Pyrometer Accessory Catalog.

When inquiring check CP 5418 opposite last page

Eliminate Explosive Combinations

(*Continued from page* 141)

motor. Motor is vertically-mounted, ½ hp, 1725 rpm, with a rated capacity of 1740 cfm at ¾" static pressure.

Exhaust duct work, fan wheel, and all parts of exhauster coming in contact with exhaust fumes are coated with Heresite.

Results: G. D. Searle & Company has used the telescoping ducts in conjunction with power exhausters to remove corrosive vapors and explosive volatile solvents for approximately the past seven years. There has been no maintenance on the power exhauster, other than for lubrication during the entire time. Operating life of the unit is about four years. Life of the exhaust unit is determined by time of failure of Heresite protective coating.

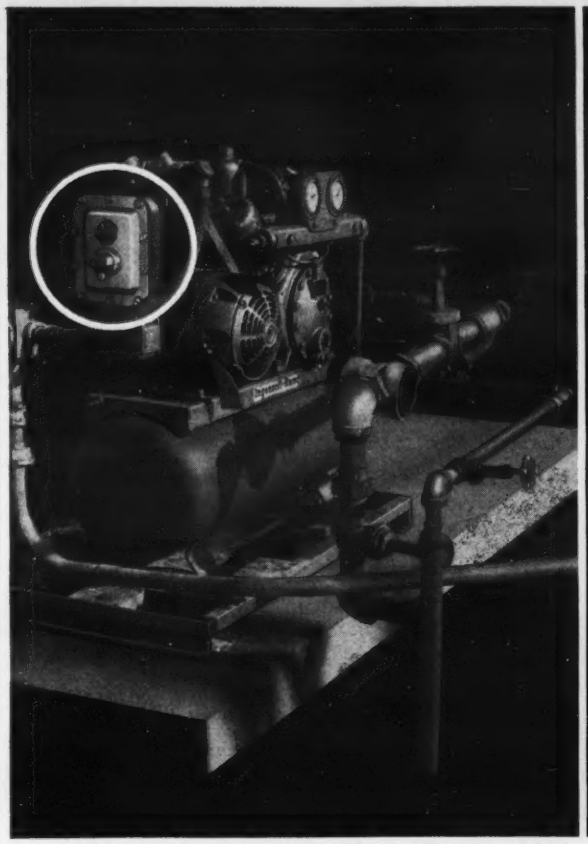
Searle & Company has found that it is less expensive to install standard air exhauster protected by Heresite coating, than to use special metals to accomplish the same purpose.

(Gallaher power exhausters are product of The Gallaher Company, Dept. CP, 4108 Dodge St., Omaha, Neb. . . . or for more information reader may simply check CP 5419 on form which is located opposite last page.)

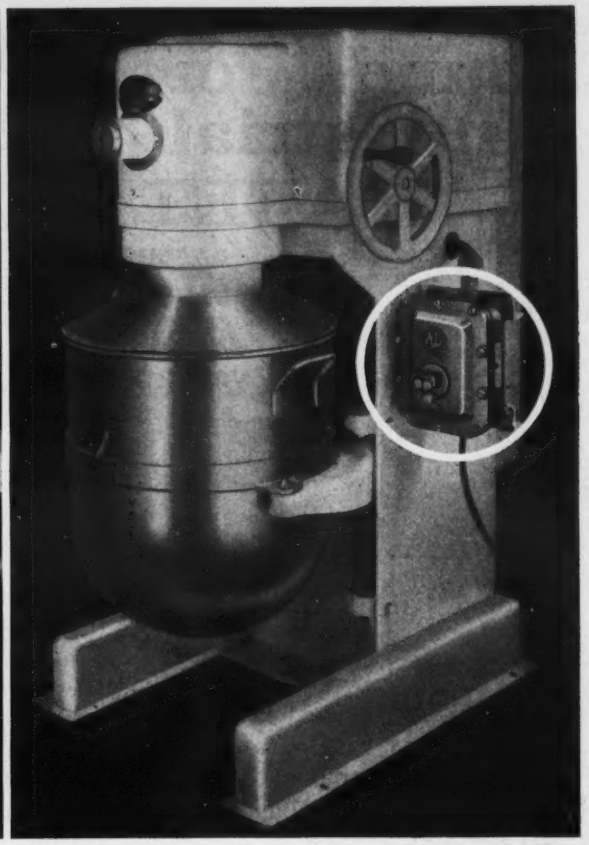
Thin stainless plate cover

. . . for back of gage case relieves pressure in event of internal explosion. Backplate is held firmly to case by screws — eliminating possibility of backplate becoming detached in event of blow-out. Gage is constructed with solid front protecting gage face. Note "before" and "after" photos of rear.

"Safecase" gage is manufactured by Jas. P. Marsh Corp., Dept. CP, 3501 W. Howard St., Skokie, Ill. . . . or check CP 5420.



Allen-Bradley explosion-proof starter on LPG Ingersoll-Rand compressor



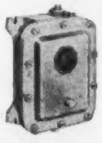
Allen-Bradley explosion-proof solenoid starter on Triumph paint mixer

CUT YOUR ELECTRICAL MAINTENANCE COSTS

by choosing the correct enclosure for every job

Type 1 General Purpose

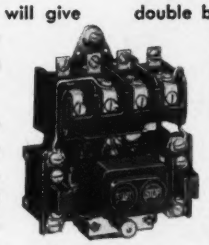
Type 4 Watertight



Type 7 Explosion-proof

When you order a motor starter, be sure to specify the type of enclosure that will give adequate protection to the starter and operator under the conditions that exist where it is used.

In the Allen-Bradley line is a variety of standard enclosures that satisfy any operating requirement. They assure long, trouble-free service and thereby cut "down time" due to unnecessary inspection or also motor starter failures.



Bulletin 709 Size 1 Solenoid Starter

Since all Allen-Bradley motor starters use double break, silver alloy contacts which require no maintenance, bolted enclosures are no problem for the serviceman. Actually, you can install an Allen-Bradley starter and forget it. There is only ONE MOVING PART ...the solenoid plunger. There are no linkages, bearings, pins, or pivots to rust and stick. Such simplicity is your guarantee of dependability.

Send for the A-B Handy Catalog!

Type 8 Hazardous Corrosive Gas

Type 9 Hazardous Dust

Type 11 Corrosion-proof

Allen-Bradley Co.
104 W. Greenfield Ave.
Milwaukee 4, Wis.

In Canada—
Allen-Bradley Canada Ltd.
Galt, Ont.

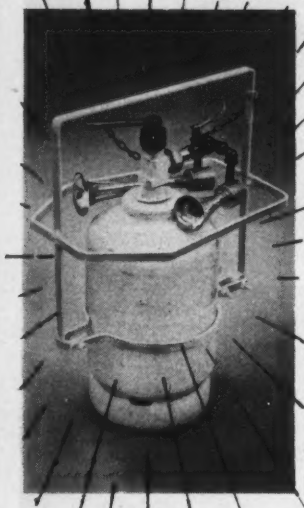
ALLEN-BRADLEY

SOLENOID MOTOR CONTROL

QUALITY

When inquiring check CP 5421 opposite last page

Sounds For Industrial SAFETY



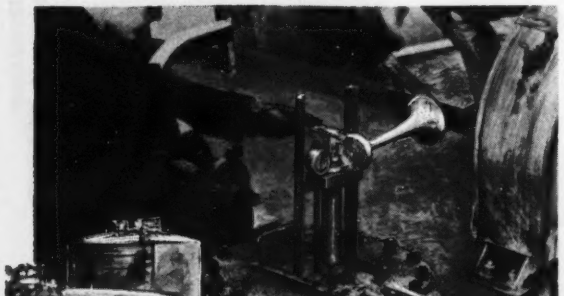
REDUCE DANGER IN HAZARDOUS VAPOR AREAS

Non-electric, "Dual-Tone Signal Horn, engineered for safety by Falcon, gives distinctive, long-range blast. Self-contained unit, completely portable, is ideal for use in chemical and industrial plants, refineries and other installations.

Freon-powered unit may be manually or remotely operated. Rigid steel guard protects horn and valve assembly.

AUDIO AID AVOIDS TANK OVERFLOW

Automatic signal device for liquid-handling operations



Falcon's Tank Overflow unit automatically signals operator when liquid approaches capacity level. Loud blast gives ample warning.

SEND for details to:

FALCON ALARM Co., Inc.
243 Broad Street, Summit, New Jersey

When inquiring check CP 5422 opposite last page

SAFETY

Resists ketone, acetone, petroleum base solvents

Uses: For protection of hands while working in ketones, acetones, and some petroleum base degreasing solvents.

Features: Curved finger and wing-thumb construction eliminates pulling loose at seam between thumb and palm.

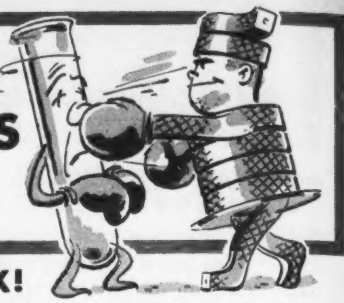
Description: Gloves are manufactured in woman's 11" gauntlet style and man's 14" gauntlet style. Coating is cherry red.

(Solvaseal work gloves are manufactured by Surety Rubber Co., Dept. CP Carrollton, Ohio. Check CP 5423 opposite last page.)

Gloves resist solvents such as ketones, acetones

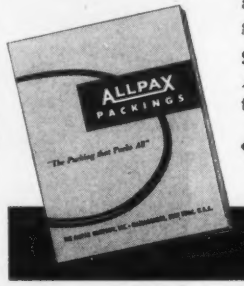
Cartoon above is reproduction of National Safety Council poster 0497-A. For more information write National Safety Council, Dept. CP, 425 N. Michigan Ave., Chicago, 11, Ill.

To keep ACIDS and CHEMICALS in their places...



you can't beat ALLPAX!

These Allpax Packings shed acids and chemicals the way a duck sheds water. Available in ring, spool or coil form. Both are the result of extensive laboratory research, and contain an acid-resisting lubricant in a special bonding compound. For use on centrifugal and rotary pumps, valve stems, etc. Contact our research department for specific recommendations.



Style No. 4—Made from long strands of asbestos fibres, anti-friction metal particles and scales of high quality graphite. For temperatures up to 600°F.

Style No. 5—Compounded of long, tough strands of blue African asbestos fibres and fine flakes of graphite. For temperatures up to 550°F.

SEND FOR OUR NEW CATALOG TODAY!
See our complete line of packings, tools, and gasket materials. Distributors in principal cities.

THE ALLPAX COMPANY
160 Jefferson Ave. • Mamaroneck, N. Y.

When inquiring check CP 5424 opposite last page

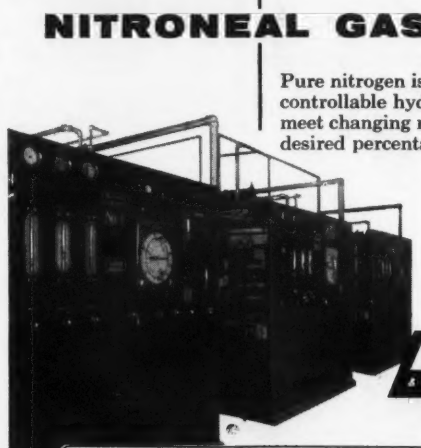
operation: FULLY AUTOMATIC, SAFE, HIGH PURITY, ECONOMICAL

results: PURE NITROGEN WITH CONTROLLABLE HYDROGREN CONTENT PRODUCED AT LOWEST COST

application: FOR MATERIAL OR PROCESS

NITRONEAL GAS GENERATOR

Pure nitrogen is produced by this equipment with a controllable hydrogen content that can be varied to meet changing requirements and maintained at any desired percentage between .25% and 25%.



Write for additional data on how the Nitroneal Gas Generator can be applied to your process or in your plant.

Request FREE, informative booklet No. 21.

BAKER & COMPANY, INC. PRECIOUS METALS
113 ASTOR ST., NEWARK 5, N. J.

ENGELHARD INDUSTRIES
NEW YORK • SAN FRANCISCO • LOS ANGELES • CHICAGO

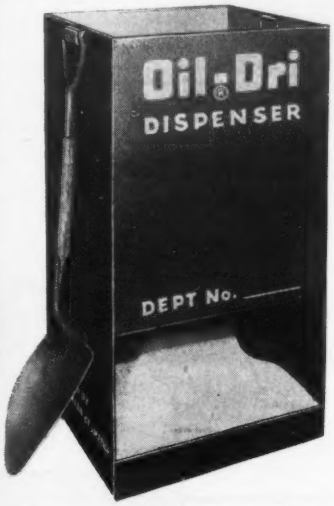
When inquiring check CP 5425 opposite last page

Makes absorber dispensing virtually effortless . . .

provides for filling, emptying, hanging shovel

Uses: Dispenser makes 150 lb of oil absorber available where and when it is needed in the plant.

Features: Screen on top of dispenser enables absorbents to be re-used. Screen filters steel chips,



Unit is equipped with side bracket for scoop or shovel

scraps, paper, and other floor sweepings from absorbent and it is dropped back into the dispenser.

Description: Operation is based on slot-type release which automatically feeds absorbents to the floor of dispenser where it is scooped up. Dispenser occupies 2¼ square feet of floor space.

(Oil-Dri Dispenser is product of Oil-Dri Corporation of America, Dept. CP, 520 N. Michigan Avenue, Chicago 11, Illinois. . . . or for more information reader may simply check CP 5426 on the Reader Service slip which is located opposite last page.)

For more information on product at right, specify CP 5427 . . . see information request blank opposite last page.

MIGHTY . . . SAFE!

Navy adopts Cellulube* fire resistant hydraulic fluids to safeguard aircraft elevator systems

To minimize danger from fires and explosions that might hamper the operational efficiency of its great carriers, the U. S. Navy is now using Celanese* Cellulube 220, a straight chemical compound, as hydraulic fluid to activate deck-edge elevators.

Used for more than 1,500 hours aboard the Bennington, Shangri-La and Ticonderoga, Cellulube 220 is in service aboard the new Saratoga, and is also being evaluated for additional Naval applications.

Cellulube 220 is one of a series of synthetic (non-petroleum) functional fluids developed for industry by Celanese in six controlled viscosities. These fire-resistant hydraulic fluids and cylinder lubricants provide a significant margin of safety wherever high temperatures and pressures may cause fire or explosion.

For additional information about the Celanese Cellulube series, write to Celanese Corporation of America, Chemical Division, Department 591-E, 180 Madison Avenue, New York 16.

In Canada, Canadian Chemical Company, Ltd., Montreal, Toronto, Vancouver.

DECK EDGE ELEVATOR TAKES PLANE TOPSIDE. Cellulube 220 is being used in elevators of this type on the Shangri-La, Bennington and Ticonderoga. The Navy plans to install fire-resistant hydraulic fluids on all carriers.

OFFICIAL U.S. NAVY PHOTOGRAPH

"U.S.S. Saratoga"

Basic reasons . . . . . for improved products

Acids, Alcohols, Aldehydes, Anhydrides, Esters — Functional Fluids, Gasoline Additives, Glycols, Ketones, Oxides — Polyols, Plasticizers, Salts, Solvents, Vinyl Monomers

Celanese* CHEMICALS

Agricultural, automotive, aviation, building, electrical, paper, pharmaceutical, plastics, surface coatings, textile

Contamination Protection of Pure Nickel at 1/6th Cost!

the structural strength of seamless steel *plus* the protection of pure nickel

BART

LECTRO-CLAD Nickel Plated Seamless Steel PIPE and FITTINGS

BART LECTRO-CLAD will withstand any fabrication process that low carbon steel itself will take — without affecting the tough, durable contamination-free nickel plate.

In the past, the Chemical Processing Industries, where contamination of product is critical, had to undergo the heavy expense of installing process lines, and equipment of pure nickel, stainless steel, or other costly contamination-free materials. NOW — in many such applications — you get the contamination and corrosion control *you must have,* at a FRACTION OF THE COST of materials offering comparable protection.

Before you spend another penny on contamination-free process lines or equipment, learn how BART LECTRO-CLAD saves thousands of dollars in initial investment alone. Send for free copy of fully illustrated catalog covering technical data and applications.

BART MANUFACTURING CORPORATION
229 MAIN STREET BELLEVILLE 9, NEW JERSEY

When inquiring check CP 5428 opposite last page

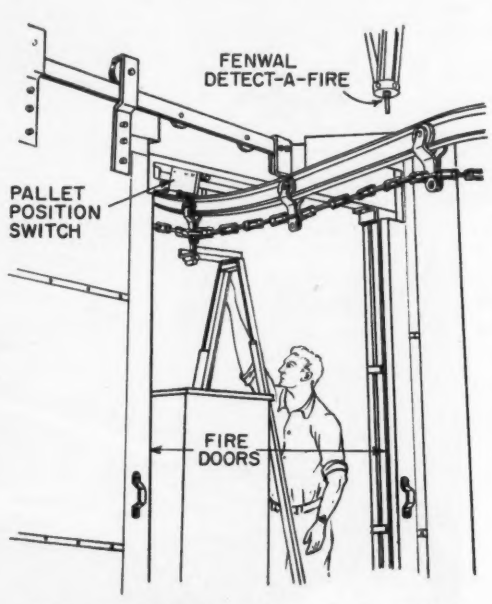
Fire doors with a brain

Close automatically if fire starts — but they wait until doorway is clear

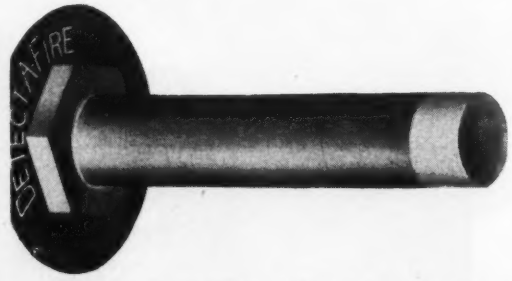
Trolley conveyor line in finishing department at R-Way Furniture Co., Sheboygan, Wis., is several thousand feet long. At one point it rises from first to fourth floor through a long inclined tunnel that could create dangerous up-draft in case of fire. To eliminate this up-draft hazard, sliding fire doors were installed at tunnel's entrance.

Door-closing mechanism must do two jobs: 1) close doors automatically, but time the closing to avoid collision with material on conveyor; 2) shut off conveyor as soon as doors start to close.

Problem was solved by door-release system that is automatically actuated by fire detector but



System prevents fire doors closing on conveyor loads in event of fire



Thermostatic fire detector elements form basis of fire protection system

SAFE · CONVENIENT DURABLE · LOW COST

BALLYMORE SAFETY-STEP LADDERS

FROM 1 TO 8 STEPS
Ladder rolls easily on large rubber ball-bearing casters
Casters retract under user's weight, legs grip floor firmly

Ballymore Safety-Step Ladders are available in a wide variety of sizes and models to meet working-height requirements up to 11'6". They are easily moved on rollers, but with no danger of "kick-out."

Made of all-welded ¾" steel tubing for maximum strength. Rust-resistant aluminum coating gives a durable, attractive finish. Handrails, optional on 2- through 8-step models, help eliminate fear of accidents. Three treads available: expanded steel, grip steel lath, and rubber-clad steel plate.

Write for specific information to Ballymore Company, Wayne 10, Pa.

BALLYMORE LADDERS

THE STANDARD BY WHICH SAFETY LADDERS ARE JUDGED

When inquiring check CP 5429 opposite last page

electrically interlocked with conveyor drive motor. Detectors, set to close at 160°F, are installed at various locations in the plant. When any detector senses abnormal temperature, it closes one of two sets of relay contacts wired in series to door release mechanism. Second set of contacts is controlled by pallet-position switch mounted on conveyor rail just beyond doorway. This switch keeps the door release circuit open until the way is clear.

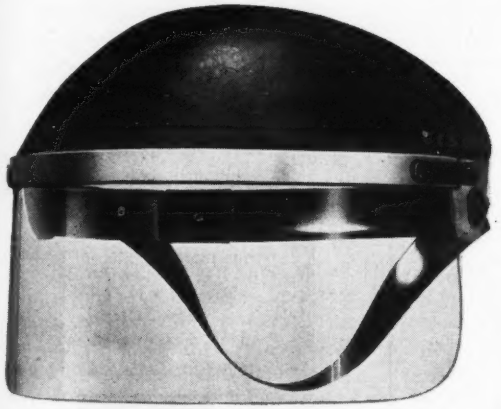
As oncoming pallet clears doorway, it trips pallet-position switch, energizing second relay controlling door release. Solenoids then release doors which slide shut by gravity. Simultaneously, pallet switch also de-energizes power relay for conveyor motor, thus stopping line before another pallet reaches doorway. A pair of normally-open switches prevent conveyor from being started unless doors are fully open.

(Detect-A-Fire detectors are manufactured by Fenwal, Inc., Dept. CP, 218 Pleasant St., Ashland, Mass. Check CP 5430 opposite last page.)

Protects eyes, is available with 3 window sizes . . .

shield may be fitted with green or clear cellulose-acetate windows

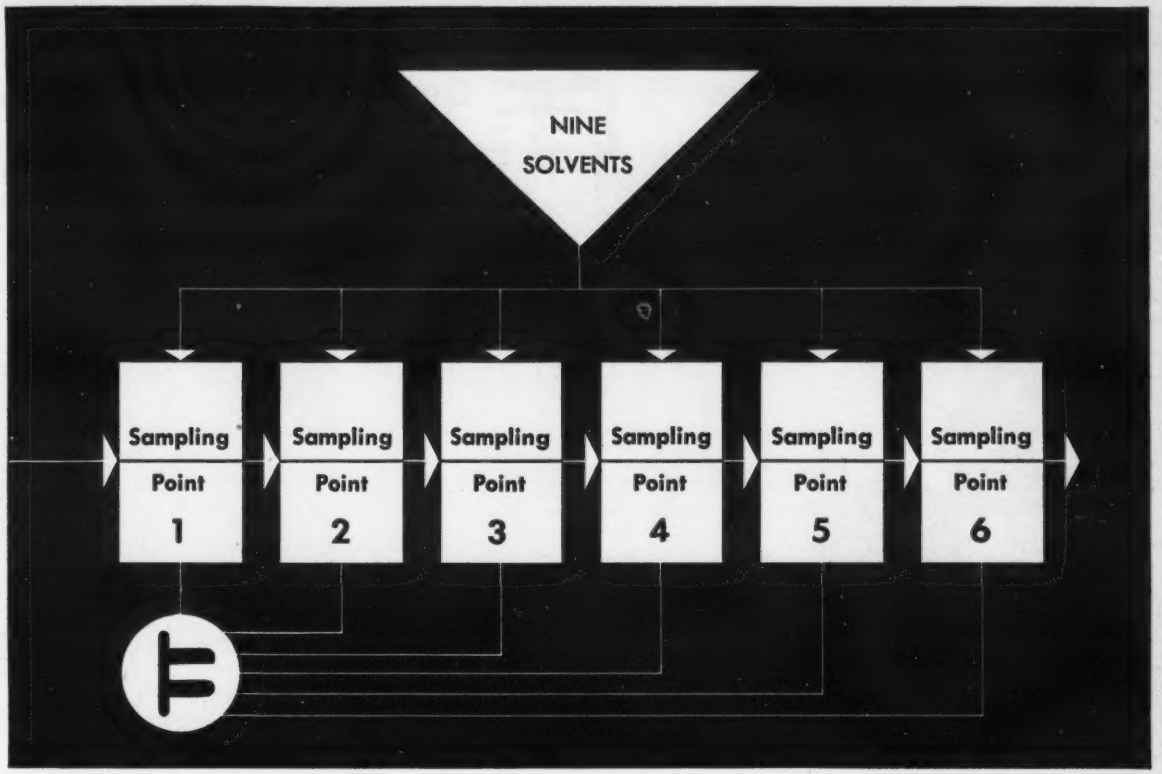
All-purpose face shield is available in three window lengths — 4, 6, and 8" measured from top to bottom. Windows mount inside aluminum channel in a tight assembly which is impervious to entrance of dirt or liquid. Flexible headband



Unit is available with 4, 6, and 8" window

has no metal or mechanical adjustment. Headband of vinyl plastic is adjusted by sliding strap. Shield conforms to head at all points. Unit is available with either green or clear cellulose-acetate windows.

(Face Shield is product of Chicago Eye Shield Co., Dept. CP, 2300 Warren Blvd., Chicago 12, Ill. Check CP 5431 on form opposite last page.)



COMBUSTIBLE VAPORS KEPT BELOW EXPLOSIVE LIMITS WITH CONTINUOUS ANALYZERS . . .

Delays in detecting LEL reduced

In a process using nine solvents with lower explosive limits ranging from 1.3% to 13%, a P-E TRI-NON* Infrared Analyzer has the job of reporting vapor concentrations continuously so they can be kept below 80% of the explosive limit.

The TRI-NON analyzer is sensitized to give an equal and linear response for each of the nine solvents. This linearity allows summation of the various combinations at each station regardless of the actual vapor concentration of any one component. Only an infrared analyzer using a selective detector can be sensitized in this manner.

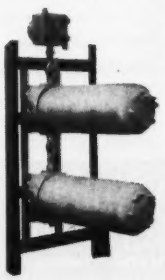
One TRI-NON analyzes samples from six different points in succession along the process line at a speed of 30 seconds per point. Each point is checked every 3 minutes — often enough in this particular application to detect any dangerous change in vapor concentration. (Instrument response times up to 3.4 seconds for 98% of final value are standard.) The TRI-NON is the only infrared analyzer with sufficient speed and stability to cover so many sampling points safely.

In combustible vapor analysis, whether the system contains one or a mixture of solvents, the TRI-NON provides the best zero and range stability available. It does not run into trouble when non-hydrocarbon materials are present in samples. Since it does not burn in order to analyze, deposits do not form in the detecting element and flash-back protection is unnecessary. Maintenance problems are kept to a minimum.

When you specify continuous analyzers for your process streams, P-E alone has a complete line of instruments to choose from. Or let us develop a complete analytical control system for you. Nowhere else can you get the combination of chemical engineering and instrument know-how that you'll find at P-E.

*T.M. The Perkin-Elmer Corp.

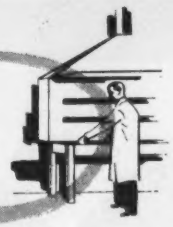
Perkin-Elmer
CORPORATION
Norwalk, Connecticut



P-E TRI-NON Analyzers are available in a wide range of models and prices to meet all types of continuous analytical problems. They are rugged and dependable, expressly designed for use in the varied environments of a processing plant or refinery. For quick and easy maintenance, instrument components can be tested right on stream — without disconnecting.

When inquiring check CP 5432 opposite last page

SAFE
moisture and fume removal



Three outstanding features make Air-Van Power Exhausters especially suited for exhausting moisture and corrosive fumes.

- A patented scroll design assures positive air removal. Gallaher Air-Vans are designed to handle up to 65,000 CFM at static pressures to 4".
- The motor is out of the air stream.
- A patented air seal-off protects the motor by creating a constant curtain of fresh air around the motor shaft. This prevents any fumes from entering the motor housing.
- Other Air-Van features include quiet operation, low silhouette, weatherproof design, availability in special metals and finishes and certified ratings based on actual physical tests.

Patents 2188741 2526290
Patents pending

The GALLAHER Company
4108 Dodge Street **Omaha, Nebraska**
Export Office: 306 Paul Bldg., Utica 2, N.Y. Cable "Keiserquip"

When inquiring check CP 5433 opposite last page

McDANEL

New 60" x 60" tank with agitator, lined with McDanel Lining Brick. Soon to be used by one of the nation's largest manufacturers of appliances.

TANK LINING
CLEAN! PURE! NON-CONTAMINATING!

● Tank's contents are guaranteed safe storage until used. McDanel Lining Brick does not contaminate or alter formula of tank's contents. Has excellent resistance to corrosion and chemical action. Fins or other protrusions from inside walls offer no installation problem. McDanel Lining Brick sets easily around sides and bottom. Broken joint installation provides custom fit for every size tank.

McDANEL Refractory Ceramics
McDANEL
REFRACTORY PORCELAIN COMPANY
BEAVER FALLS · PENNSYLVANIA

Write today for Bulletin B1-55 on McDanel Tank and Mill Lining Products

When inquiring check CP 5434 opposite last page

Non-sparking, non-magnetic, chain weighs 65% less than steel

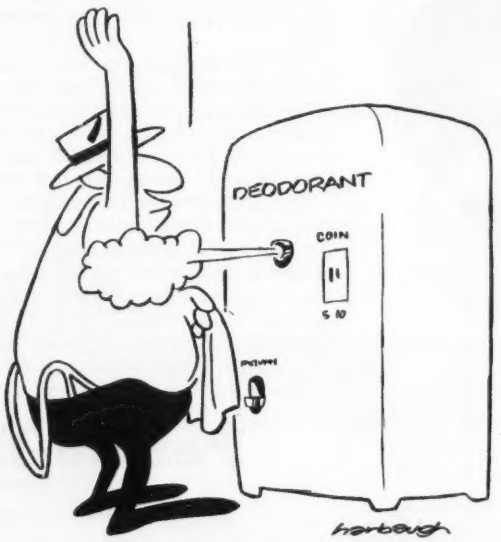
Uses: Aluminum chain is available for hazardous applications where non-sparking qualities are needed, or for applications where magnetic quality of steel might be a factor.

Features: Chain combines non-sparking, non-magnetic, corrosion-resistant qualities of aluminum.

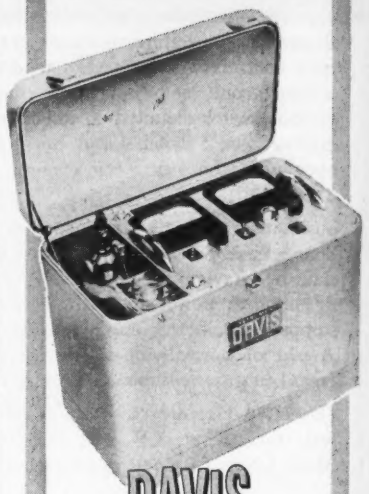
Aluminum chain weighs 65% less than steel chain

Description: Welded chain is available in ¼, 5/16, ⅜, and ½" sizes. Working load limit of welded chain is about 60% that of welded steel chain and its weight is 65% less than that of steel.

(Welded aluminum chain is manufactured by The McKay Co., Dept. CP, 359 McKay Bldg., Pittsburgh 22, Pa. Check CP 5435 opposite last page.)



Measures oxygen and combustibles simultaneously!



DAVIS PORTABLE COMBUSTION TESTER

A double duty portable precision instrument for the analysis of exhaust gases in varied combustion processes. Oxygen and combustibles measured and indicated on separate meters simultaneously. A Davis representative will gladly arrange a demonstration at your plant.

Size: 18" x 12" x 18"
Weight: 40 lbs.
115V, 60 cycle operation

Send for Bulletin 11-34

INSTRUMENT DAVIS DIVISION

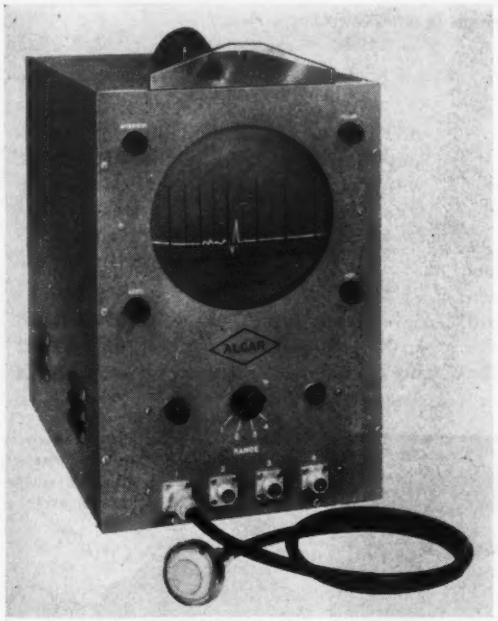
DAVIS INSTRUMENTS
Division of
Davis Emergency Equipment Co., Inc.
56 Halleck Street, Newark 4, N. J.

When inquiring check CP 5436 opposite last page

Detects flaws in metals, glass, plastics . . .

unit scans ranges from .025 to .3 inches; other ranges available

Uses: Unit offers non-destructive testing of metals, glass and non-filled plastics. Device gives visual indication of material thickness . . . requires access to only one side of work to be measured. Flaws due to discontinuity or lack of bonding are indicated by shift or disappearance of thickness reading on calibrated screen.



Device gives visual indications of material thickness — requires access to only one side of work to be measured

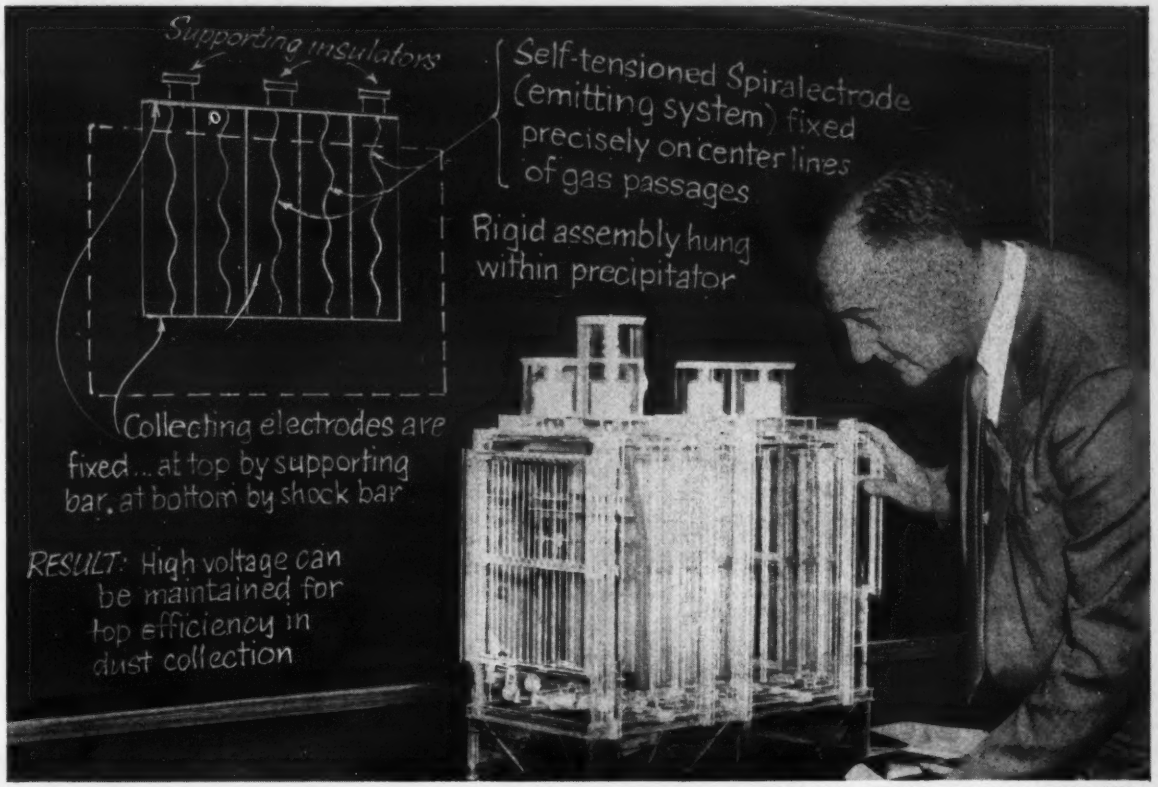
Features: Standard unit scans four of the most commonly used ranges from .025 to .3 inches. Calibrated screens are provided for these ranges. Other ranges are available, if required.

Description: Unit consists of an oscillator, cathode ray oscilloscope and transducer which transmits ultrasonic vibrations into material to be tested. When oscillator frequency is same as resonance frequency of material, a vertical marker appears on face of tube, indicating exact thickness of material on calibrated screen.

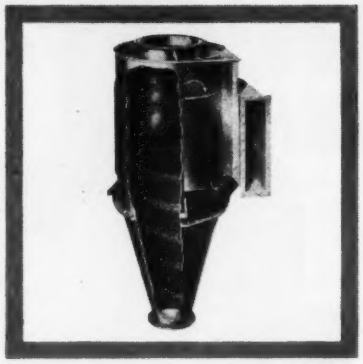
Unit is portable, weighs approximately 50 lb. Controls include range switch, on-off switch, four output jacks, and level.

(Inspectogage 55 is manufactured by Alcar Instruments, Inc., Dept. CP, 17 Industrial Ave., Little Ferry, N.J. . . . or for more information reader may simply check CP 5437 on form which is located opposite last page.)

How fixed electrodes assure top efficiency in a Buell "SF" Precipitator

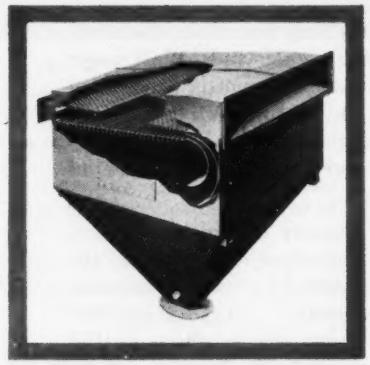

Supporting insulators
Self-tensioned Spiralelectrode (emitting system) fixed precisely on center lines of gas passages
Rigid assembly hung within precipitator
Collecting electrodes are fixed... at top by supporting bar, at bottom by shock bar
RESULT: High voltage can be maintained for top efficiency in dust collection

PHOTOGRAPH OF BUELL PLASTIC MODEL BY INDUSTRY & POWER



Buell Cyclones also assure top efficiency with large diameter design to eliminate clogging . . . and by harnessing double-eddy and putting it to work.

Even when high-resistivity dusts must be collected, top efficiency is guaranteed by the exclusive shape of Buell's Spiralectrodes—proved to give 50-100% greater emission than straight wires. Exclusive Continuous Cycle Rapping virtually eliminates maintenance by keeping electrodes constantly clean.



Buell's Low Resistance Fly Ash Collector combines top efficiency to meet present strictness, with low draft loss for natural or mechanical installations.

GET ALL THE FACTS
Write to:
Buell Engineering Company,
Dept. 11-E, 70 Pine Street,
New York 5, New York

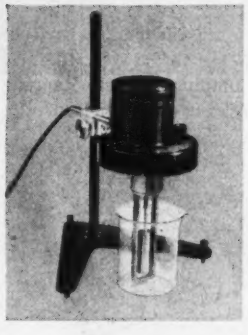
buell®

MECHANICAL ELECTRICAL

Experts at delivering Extra Efficiency in **DUST COLLECTION SYSTEMS**

When inquiring check CP 5438 opposite last page

Look behind!
you need another
Brookfield Viscometer



You, too, probably rely more on viscosity for quality control, than ever before. The easy accuracy, positive convenience of Brookfield viscometers has made this possible. To take profitable advantage of viscosity control, your current equipment must keep pace with laboratory and production demands. We'll wager your Brookfield viscometer needs some help — one or two partners to help save costly man hours, increase efficiency, and be on hand in case of emergency.

The economy of Brookfield viscometers and allied equipment — the world's standard for viscosity measurement and control — makes it your best move to write, wire or phone for full information today!

Brookfield
ENGINEERING LABORATORIES, INC.
STOUGHTON 14, MASSACHUSETTS

When inquiring check CP 5439 opposite last page

for the laboratory

Work at Esso Research Center in Linden, New Jersey, runs from very routine analysis to complicated interpretive research studies. Three tools used in these jobs have proved important in speeding lab work as . . .

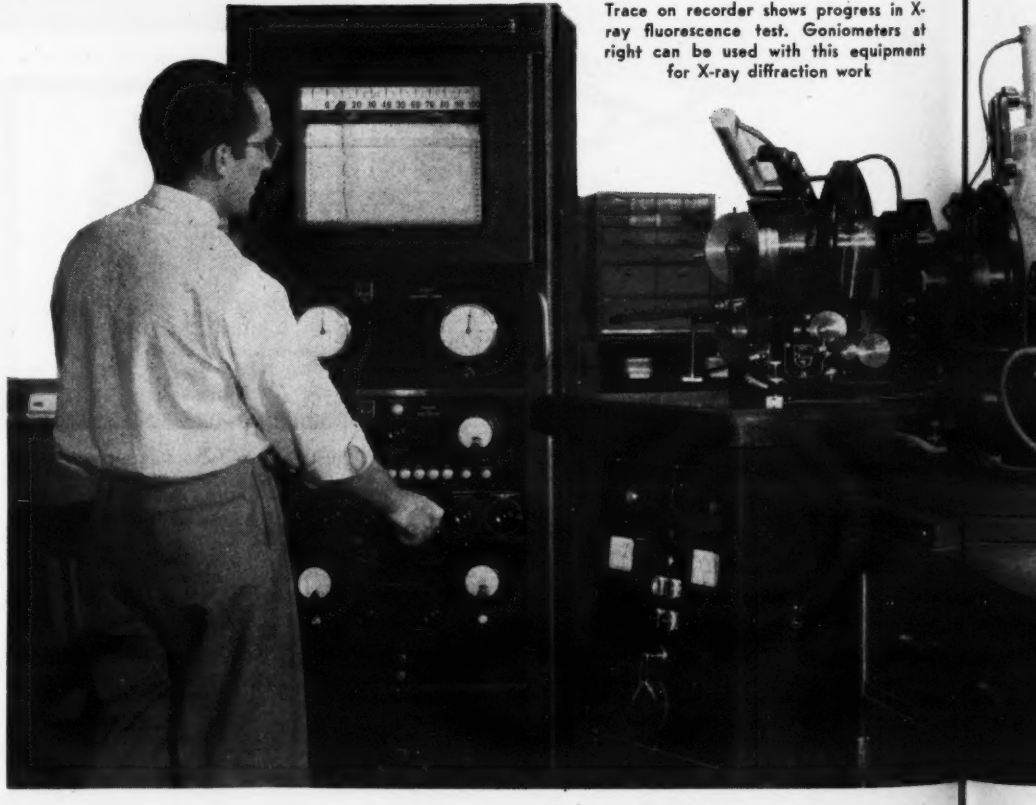
ESSO X-RAYS

1. for routine measurement of TEL (X-ray absorption)
2. for analysis of tricky engine deposits, catalysts (X-ray diffraction)
3. for determination of catalyst contaminants or additive metals in oils (X-ray fluorescence)

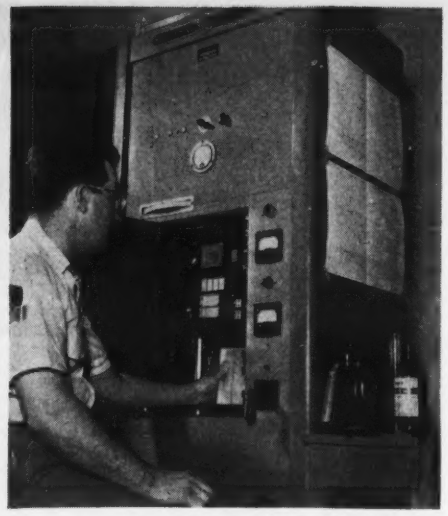
BRUCE FADER, Associate Editor
With **WILLIAM J. TROELLER**, Head
Analytical Laboratories, Esso Research Center
Linden, New Jersey

Analysis for tetraethyl lead in motor fuel is a continuing job for laboratory men at Esso Research Center. While standard methods are straightforward, they require skill and attention, and lots of time. The ASTM standard method of test, for example, involves extraction of the sample with hydrochloric acid, and after digestion with nitric acid, precipitation of lead chromate and gravimetric determination of the lead. This requires an elapsed time of about twenty-four hours.

Several years ago, Esso Research installed an X-ray photometer for this routine task. In operation this device beams X-rays



Trace on recorder shows progress in X-ray fluorescence test. Goniometers at right can be used with this equipment for X-ray diffraction work



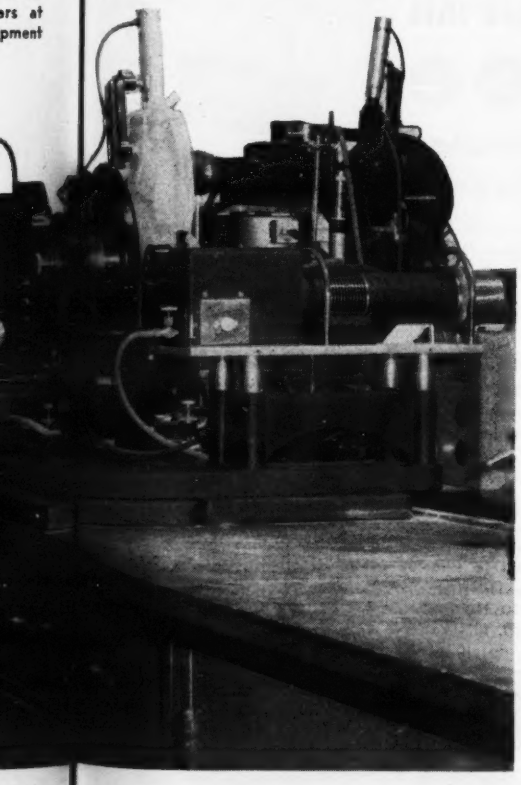
Sample of gasoline is placed inside cabinet of X-ray photometer

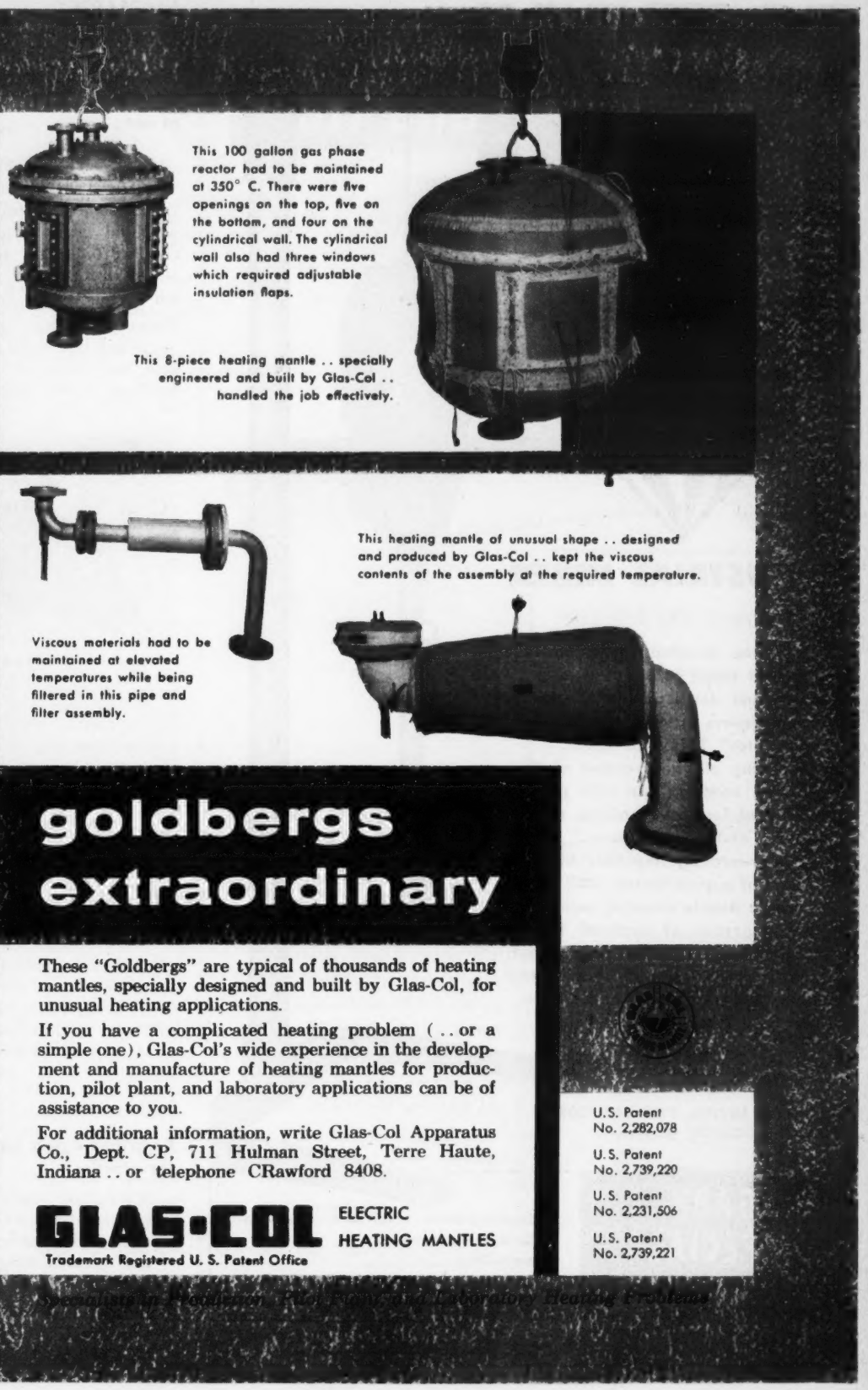
through an unknown sample and through a polystyrene block (standard) simultaneously. Beams then hit a fluorescent material whose light output is picked up by phototube. Calibrated attenuator is adjusted until output from beams is equal — and lead content can be calculated from it.

With this method the elapsed time per test is about fifteen minutes.

Instrument can also be used for determining sulfur

(*Please turn to page* 155)




This 100 gallon gas phase reactor had to be maintained at 350° C. There were five openings on the top, five on the bottom, and four on the cylindrical wall. The cylindrical wall also had three windows which required adjustable insulation flaps.
This 8-piece heating mantle .. specially engineered and built by Glas-Col .. handled the job effectively.
Viscous materials had to be maintained at elevated temperatures while being filtered in this pipe and filter assembly.
This heating mantle of unusual shape .. designed and produced by Glas-Col .. kept the viscous contents of the assembly at the required temperature.
goldbergs extraordinary
These "Goldbergs" are typical of thousands of heating mantles, specially designed and built by Glas-Col, for unusual heating applications.
If you have a complicated heating problem (..or a simple one), Glas-Col's wide experience in the development and manufacture of heating mantles for production, pilot plant, and laboratory applications can be of assistance to you.
For additional information, write Glas-Col Apparatus Co., Dept. CP, 711 Hulman Street, Terre Haute, Indiana .. or telephone CRawford 8408.
GLAS-COL ELECTRIC HEATING MANTLES
Trademark Registered U. S. Patent Office
U.S. Patent No. 2,282,078
U.S. Patent No. 2,739,220
U.S. Patent No. 2,231,506
U.S. Patent No. 2,739,221
Specialists in Precision, Pilot Plant and Laboratory Heating Problems

When inquiring check CP 5440 opposite last page

NEW

"SMALL BATCH"

SHEAR-FLOW

GABB SPECIAL PRODUCTS

INDUSTRIAL MIXER

To meet the demand for a portable yet rugged mixer to be used by research and development technicians, Gabb engineers have produced this "Small Batch" industrial mixer. Incorporating all the features of its companion models, this little giant can be used for homogenizing, mixing, dispersing and emulsifying.
Its counter-rotating impellers have a clearance of approximately .005" which produces a double shearing action for perfect dispersion of material. This mixer should be standard equipment in every plant requiring small batch mixing. Send the coupon for complete details and prices now!

CUT YOUR MIXING TIME AND COST. MAIL THE COUPON NOW.

GABB SPECIAL PRODUCTS
Division of E. Horton & Son Co.
WINDSOR LOCKS, CONN

☐ Have representative call for demonstration
☐ Send more information
Name-Position
Co & Address

When inquiring check CP 5441 opposite last page

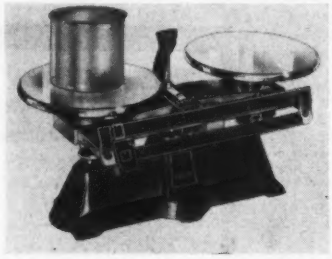
LABORATORY

Has undivided tare beam for fast reading of net . . .

adjustable tare poise has extended handle

Uses: For laboratory and plant weighing where sensitivity greater than 0.1 gram and capacity larger than 2 kgm are not required.

Features: Trip balance has undivided tare beam and adjustable tare poise for fast, direct readings of net weights.



Plates of trip balance are stainless steel

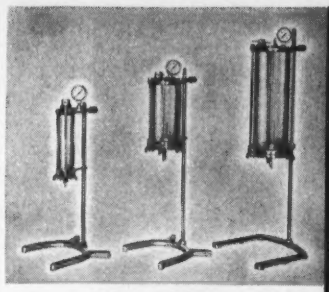
Description: Trip balance has two beams, one calibrated 200 times 10 grams, the other times 0.1 gram. Plate material is stainless steel and diameter is six inches. Beams are die-cast aluminum alloy with ends cross-braced. View dial is tilted for easier reading. Bearings are self-aligning polished agate. Knives are steel with a hard-wearing surface.

(Balance is product of Ohaus Scale Corp., Dept. CP, 1050 Commerce Ave., Union, N.J. . . . or for more information check CP 5442 on form opposite last page.)

Describes aging bath for plastics

Two-page leaflet describes high-temperatures aging bath suitable for rubber and plastics. Bath is fitted for either water or oil.

Bul 668 is issued by Precision Scientific Co., Dept. CP, 3737 W. Cortland Ave., Chicago 47, Ill. When inquiring specify CP 5443 opp. last page.



Illustrated above, left to right: Model 9; Model 10; Model 21 and 21-1.

ERTEL LABORATORY *Cylinder Type* **FILTERS**

- Sizes for all laboratory filtration requirements
- Accomodates Standard Ertel Asbestos Filter Sheets as well as any other type filter media

MODEL	CAPACITY Cu. Cm.	CAPACITY Ounces	SHEET Dia.	AREA Sq. In.
21-1	3750	128	5¼"	21
21	3000	96	5¼"	21
10	1300	45	4¼"	9.62
9	260	9	2¼"	3.34

● The Ertel Cylinder Type Laboratory Filter is one of the most important pieces of equipment in hundreds of modern laboratories throughout the world. Available in either stainless steel, hard rubber, plastic, or brass nickel plated material, to meet all filtration requirements.

One of the features of the filter is that it will accommodate any type filter medium. Construction permits refill without disassembly. Thumb screw permits raising or lowering the unit to accommodate various height vessels.

MODEL E-1 FILTER in brass nickel plated or stainless steel. Holds one 10" dia. filter sheet. Shipped with pump and motor. For lab or 5 to 10 gallon batch use.

ERTEL ENGINEERING CORPORATION
KINGSTON 3, NEW YORK
Branch Office & Showroom Located in New York City
COMPLETE LINE OF *Liquid Handling Equipment*
ERTEL Since 1922

When inquiring check CP 5444 opposite last page

get this free illustrated bulletin

How you Can Save Time Measuring Surface Temperatures in Your Plant with

ALNOR PYROCONS

The Alnor Pyrocon combines laboratory precision with production tool ruggedness to give you fast, accurate answers to *all* surface temperature problems. It takes just 3 seconds to give you the temperature of any surface . . . regardless of shape or material . . . revolving or stationary. And the heavy, shock-resisting movement is housed in a balanced unit that's compact, easy to handle.

Mail this ad with your business letterhead to Illinois Testing Laboratories, Inc., Room 504, 420 N. LaSalle St., Chicago 10, Ill.

Alnor

PRECISION INSTRUMENTS FOR EVERY INDUSTRY

When inquiring check CP 5445 opposite last page

DURABLE!

Resist heat, wear and corrosion

"Metalsmiths" Stainless Steel and Monel Utensils

Designed and constructed to meet the strictest requirements of Chemical lab and plant. Many sizes in items shown, plus stock pots, batch cans, beakers, shovels. Try "Metalsmiths" utensils and compare the value. We ship promptly — anywhere.

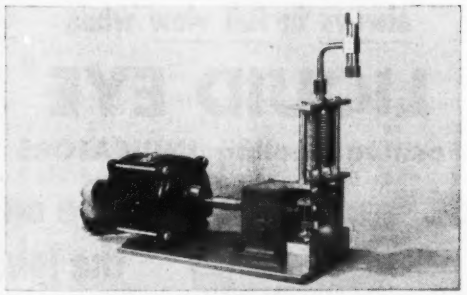
WRITE FOR LATEST CATALOG — PRICE LIST

METALSMITHS

Division of **Orange Roller Bearing Co., Inc.**
556 White Street Orange, N. J.

When inquiring check CP 5446 opposite last page

***New!* Explosion Proof Motor**



in the Corson-Cerveny Micro-Bellows Pump

In this model of the Corson-Cerveny Micro-Bellows Pump, the motor is totally enclosed and sealed, in other words is explosion proof. (Underwriters' Laboratories approved.)

It has all the other features of the regular model Corson-Cerveny Micro-Bellows Pump *plus* a maximum working pressure of 500 lbs.

All parts of the Corson-Cerveny Micro-Bellows Pump in contact with the liquid being pumped are made of stainless steel and machined so that they fit together without packing, gasket material or any pipe compounds, preventing contamination of material being pumped. Write for complete information.

RESEARCH APPLIANCE COMPANY
Box 307 Allison Park, Pa.

When inquiring check CP 5447 opposite last page

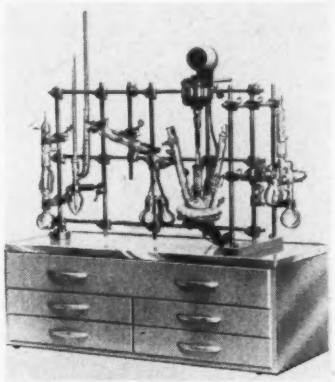
Complete laboratory for organic work in miniature . . .

kit has basic components for synthesis and analysis

Uses: For organic syntheses and analyses in volumes of less than 5 to 50 milliliters.

Features: Glassware kit is complete, small, organic chemistry laboratory and occupies only 2.5 square feet of laboratory space.

Description: Miniature laboratory has basic components for fractionation, steam, atmospheric

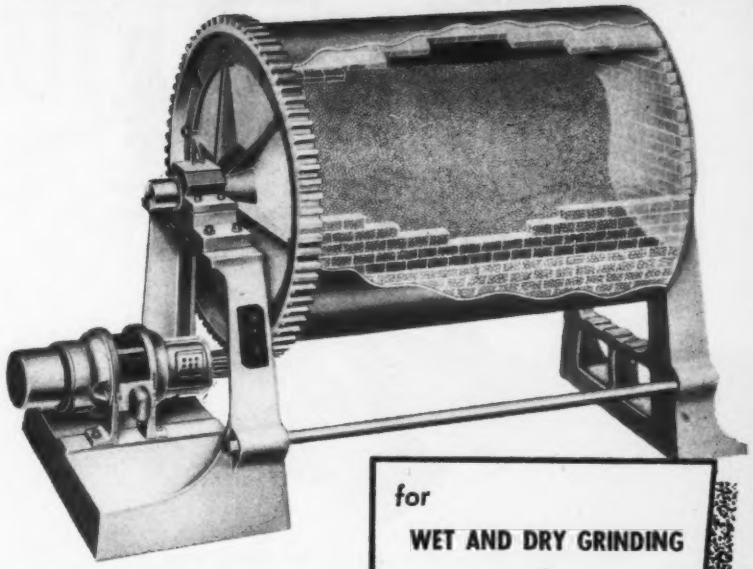


Complete organic lab requires only 2½ square feet

and vacuum distillation, chromatographic analysis, extraction, filtration, reflux, and separation. Accessories for supporting, clamping, heating, agitating are also supplied. Cabinet serves as storage area for parts. Aluminum supporting framework is bolted to chemically-resistant top of cabinet. Glass apparatus has special ground joints. Standard taper joints have cylindrical outer walls to insure firm clamping with small scale extension clamps. Ball and socket joints are used for connections on distillation apparatus. Closed connections on glass apparatus are standardized so ¼" rubber or plastic tubing can be used.

(Bantam-ware kit is product of Kontes Glass Co., Dept. CP, 25 Spruce St., Vineland, N. J. . . . or for more information check CP 5448 opposite last page.)

ABBÉ Engineering Ball and Pebble Mills



for
WET AND DRY GRINDING
•
DISPERSING
•
MIXING
•
PROCESSING

ABBÉ Engineering Ball and Pebble Mills are available in capacities from 30 lbs. (dry), 5 gal. (wet), to 14,000 lbs. (dry), 2500 gal. (wet).

It will pay you to investigate these, as well as Abbé Jar Mills and Jar Rolling Machines, which cover every need and capacity.

Write for Catalogs 73 and 77 and complete data.

ORIGINATORS OF ABBÉ ENGINEERING CO. ABBÉ PEBBLE MILLS

ABBÉ ENGINEERING COMPANY
50 Church Street, New York 7, N. Y.
Address Department 46

When inquiring check CP 5449 opposite last page

Heliquad Rotors give Kinney Rotary Pumps

"ADDED MUSCLE"

Five Impeller Double Helical Rotor
Seven Impeller Double Helical Rotor
Three Impeller Double Helical Rotor
Five Impeller Single Helical Rotor
KINNEY

The unique Heliquad design of the rotors used in KINNEY® Rotary Liquid Pumps gives them the "added muscle" needed to handle those extremely difficult process pumping assignments. If you need efficient, dependable positive-displacement of hard-to-handle materials, check these Kinney features:

- wide viscosity range, from gasoline to black strap molasses
- choice of impellers to suit specific job requirements
- continuous non-pulsating delivery over full capacity range
- more displacement per revolution than conventional gear pumps
- timing gears and bearings outside pumping chamber
- design eliminates friction and wear within cylinder

Kinney offices at Baltimore, Chicago (La Grange), Cleveland, Los Angeles, New York, Philadelphia, San Francisco and St. Louis are competently staffed by men waiting to help you solve your pumping problems. **Write for additional data today!**

Kinney

KINNEY MFG. DIVISION
THE NEW YORK AIR BRAKE COMPANY
3573 WASHINGTON STREET • BOSTON 30 • MASS.
INTERNATIONAL SALES OFFICE, 90 WEST ST., NEW YORK 6, N.Y.

• **Please send Bulletin L51A** describing the complete line of Kinney Liquid Pumps.

Name .....
Company .....
Street .....
City ..... State .....

When inquiring check CP 5450 opposite last page

LABORATORY

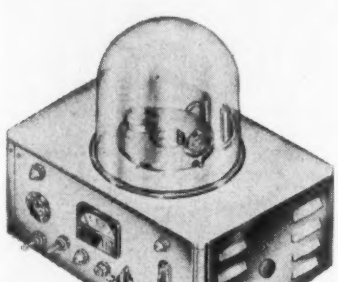
Doesn't need dry ice for freeze drying under vacuum . . .

has no cold trap and operates without attention

Uses: For small-scale freeze drying under vacuum of frozen specimens of bone, tissue, cultures, other biologicals.

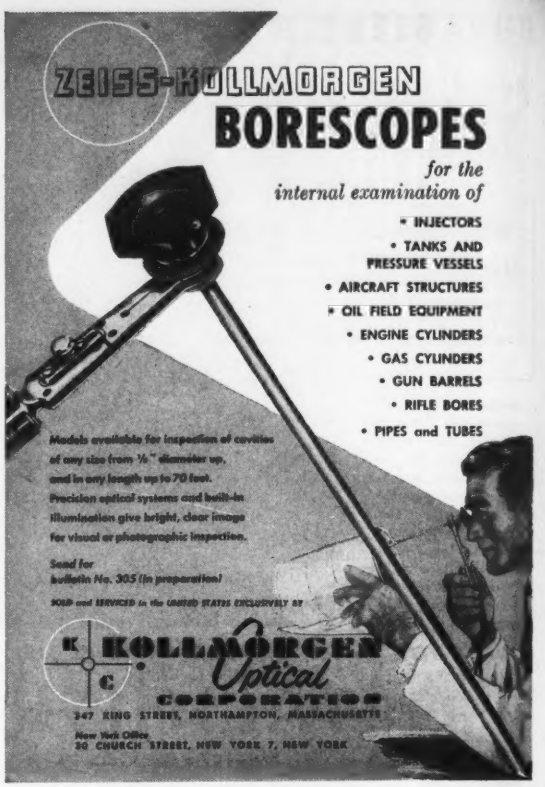
Features: Freeze dryer will operate without being serviced with dry ice.

Description: Specimen is inserted under bell jar. Less than two minutes are required to reach operating pressure. Ultimate vacuum can be lower than 1 μ. Vacuum pump is rotary gas ballast. Vacuum gage has four decade logarithmic scale with accuracy of approximately $\pm 5\%$. Pump is 15 cfm and has 1 hp motor. Cabinet is enameled steel and base plate is polished aluminum. Heater is a 300 watt circular plate with heater control being a 3 amp variable transformer. Unit requires 2 kva at 110v, 60 cps. Bench area required for cabinet is 21 x 15". Total cabinet height with bell jar is 21".



Specimen is inserted under bell jar for high vacuum drying

(Model 3505 freeze dryer is product of Naresco Equipment Corporation, Dept. CP, 160 Charlemont Street, Newton Highlands 61, Massachusetts . . . or for more information about manufacturer's product, reader may simply check CP 5451 on the convenient Reader Service slip which is located opposite last page.)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• INJECTORS
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• OIL FIELD EQUIPMENT
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• PIPES and TUBES
Models available for inspection of cavities of any size from ½" diameter up, and in any length up to 70 feet. Precision optical systems and built-in illumination give bright, clear image for visual or photographic inspection.
Send for bulletin No. 305 (in preparation)
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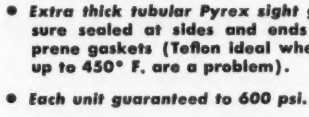
LIQUID EYE®

Positive Sealing INDICATORS



are on the job!

Illustrated: 3000 Series I.P.S.

- ***Extra thick tubular Pyrex sight glass* — double pressure sealed at sides and ends with Teflon or Neoprene gaskets (Teflon ideal where high temperatures up to 450° F. are a problem).**
- ***Each unit guaranteed to 600 psi.***
- ***Unrestricted full line flow.***
- ***Precision made in cadmium plated steel or in brass* (also available with stainless steel springs for use with corrosive fluids).**
- **Wide variety of applications.**

Write today for Catalog D-55 covering the Allin line.

Standard sizes ¾", 1" and 1¼" I.P.S., with larger sizes available. Special units can be made to your exact specifications.

Allin MANUFACTURING COMPANY
1153 W. Grand Ave., Chicago 22, Ill.

When inquiring check CP 5453 opposite last page

Esso X-rays

(*Continued from page* 151)

in oils where sulfur content exceeds a few tenths of a percent. In general it will detect any relatively heavy atom with sensitivity which increases with increasing atomic weight.

Maintenance gives little trouble. Calibration must be checked whenever a tube is replaced — perhaps three or four times a year.

In tackling more delicate analysis problems, Esso Research personnel often resort to an X-ray diffraction technique. This is generally used in problems where crystal structure and arrangement are paramount — catalyst evaluation, spark plug or engine deposit studies. X-ray diffraction techniques went into service at Esso in 1940. Among work accomplished with this instrument has been identification of combustion chamber deposits, analysis of foreign materials in fuel lines and tanks, and the determination of free silicon dioxide in dust samples.

In a typical case — study of engine deposit — a test run can be made in 20 to 40 minutes. Interpretation of results for a "complicated" deposit may take from several hours to several days. This "complication" depends on number of materials present. Combustion chamber deposits commonly contain over a dozen lead compounds including the oxysulfate, elemental lead, lead bromide, and lead chloride.

X-ray spectra are positive identification for about 6000 materials in card files at Esso.

Introduction of X-ray fluorescence methods in 1952 permitted the precise analysis of contaminants in catalysts. Shortly before that, conventional chemical analyses had been shown to find no difference between two batches of catalyst; one good and one bad. Metal containing additives in lubricating oils (barium, calcium, and zinc) can also be determined with the X-ray fluorescence spectrograph.

(X-ray Photometer is a product of General Electric Co., Dept. CP, Schenectady, 5, N. Y. . . . or check CP 5454 on form opposite last page.)

(X-ray diffraction and fluorescence equipment is built by North American Philips Co. Inc., Dept. CP, 750 S. Fulton Ave., Mount Vernon, New York. Check CP 5455 opposite last page.)

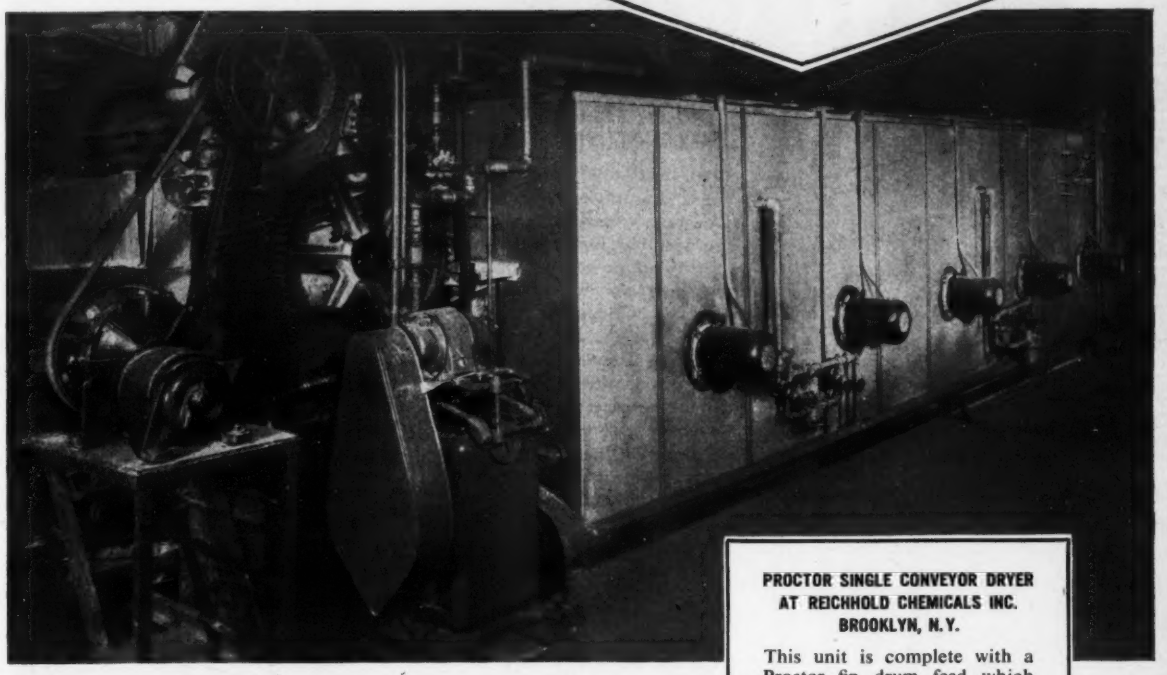
To determine pressure drops in cascade coolers, use the convenient nomograph which appears on page 222

IN EVERY INSTALLATION

Proctor **Drying Ranges**

offer:

Highest Drying Uniformity
Consistent Product Quality
More Profitable Operation



PROCTOR SINGLE CONVEYOR DRYER AT REICHHOLD CHEMICALS INC. BROOKLYN, N.Y.

This unit is complete with a Proctor fin drum feed which preforms pigment into sticks of uniform thickness and deposits them directly onto the conveyor dryer.

In every installation, Proctor Drying Ranges provide higher drying speeds resulting in increased yields, and profits. Proctor equipment offers the control and flexibility essential for uniform drying, insures consistent high product quality.

Many wet-solid materials heretofore considered unsuitable for conveyor drying can now be handled efficiently by means of Proctor pre-forming techniques. And, as always, Proctor equipment carries performance guarantees based on wide experience and careful analysis of the requirements. Write for complete information.

PROCTOR DRYING EQUIPMENT FOR FOOD AND PROCESS INDUSTRIES

Tray Dryers

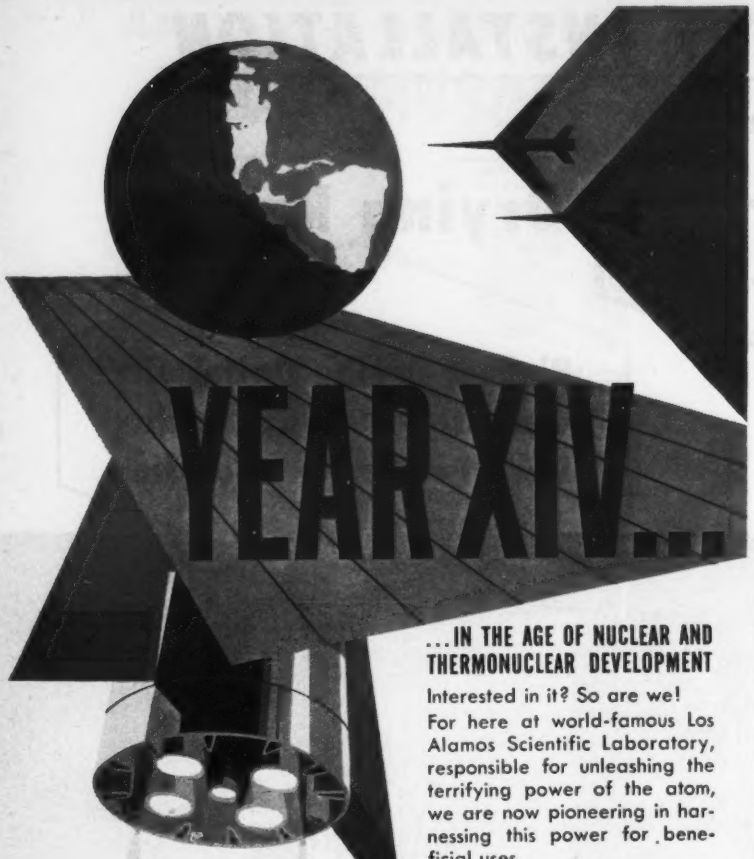
Truck Dryers **Pre-forming Feeds**

Spray Dryers

Proctor **PROCTOR & SCHWARTZ, INC.** Philadelphia 20, Pa.

Manufacturers of Industrial Drying Equipment and Textile Machinery

When inquiring check CP 5456 opposite last page



...IN THE AGE OF NUCLEAR AND THERMONUCLEAR DEVELOPMENT

Interested in it? So are we!

For here at world-famous Los Alamos Scientific Laboratory, responsible for unleashing the terrifying power of the atom, we are now pioneering in harnessing this power for beneficial uses.

There is exciting adventure in the application of nuclear and thermonuclear energy to weapons, power and propulsion.

Supporting these diverse activities here at Los Alamos are many challenging projects in basic physics, chemistry, metallurgy, mathematics and engineering.

Los Alamos needs men and women with imagination and research ability for permanent career positions. Interested? So are we!

Write us for an illustrated brochure describing the Laboratory, its delightful mountain location and its excellent housing and community facilities. Mail your request to

DIRECTOR OF PERSONNEL
DIVISION 802

LOS ALAMOS SCIENTIFIC LABORATORY IS NOW IN ITS 14TH YEAR OF OPERATION.

los alamos
scientific laboratory
OF THE UNIVERSITY OF CALIFORNIA
LOS ALAMOS, NEW MEXICO

FOR THE LABORATORY

Save freight and storage space with single-trip containers of reagent chemicals . . .

throw-away bottles and cases weigh less and are smaller than returnable containers

Uses: Saving space in storage rooms and reducing freight charges for same amount of chemical received in returnable containers.

Features: Containers for reagent-grade chemicals require no deposit and are single-trip throw-aways. Bottles have a dripless sleeve of polyethylene for easier pouring.

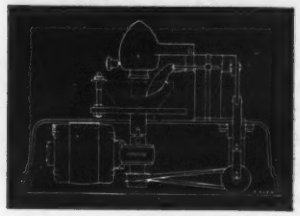
Description: CP reagent grade chemicals are packed in corrugated fiberboard cases, six 5-pint bottles to a case. Shipment in the throw-away cases has been approved for reagent grade sulfuric acid, hydrochloric acid, glacial acetic acid, and ammonium hydroxide. Case weight is maximum of 74 lb, for sulfuric acid, which can easily be handled by one man. Gross weights of the others are less, i.e., hydrochloric acid being 56 lb.

Manufacturer suggests that an additional saving will be possible because the throw-away containers require no deposit and bothersome, expensive bookkeeping for containers will no longer be necessary.

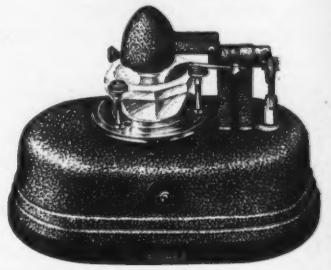
(Reagents in throw-away bottles and containers are product of Grasselli Chemicals Department, E. I. Du Pont De Nemours & Company (Inc.), Dept. CP, Wilmington 98, Del. . . . or for more information check CP 5457 opposite last page.)

"Miss Smith certainly lends a homey touch to the lab"

FISHER
MORTAR GRINDER



FOR AUTOMATIC, CONTINUOUS GRINDING



Save Time, Save Work, Save Material! Grind any non-gummy, non-fibrous material automatically and efficiently with the Fisher Mortar Grinder. Sturdily constructed, and permanently lubricated for quiet, trouble-free, year-in and year-out service. Interchangeable mortars and pestles install quickly; mortar empties easily.

Pestle reaches all parts of mortar during each six revolution cycle, grinds sample uniformly and completely.

GRINDS

Agate
Asbestos
Flint
Ores
Clays
Cements
Carbons
Hard Metals
Coals
Carbides
Silica
Coke
Clinkers
Dolomite
Brittle Resins
Pigments
Rocks
Pumice
Quartz
Glasses
Enamels
Soils
Chemicals
Emery
and many other materials

MORTARS AND PESTLES TO FIT YOUR NEEDS

- Mullite
- Agate
- Porcelain
- Tool Steel
- Kennametal

For complete data sheet, write
103 Fisher Bldg., Pittsburgh 19, Pa.

8-10a

FISHER SCIENTIFIC

Boston, Buffalo, Chicago, Cleveland, Detroit, New York, Philadelphia, Pittsburgh, St. Louis, Washington, Montreal, Toronto

America's largest Manufacturer-Distributor of Laboratory Appliances and Reagent Chemicals

When inquiring check CP 5458 opposite last page

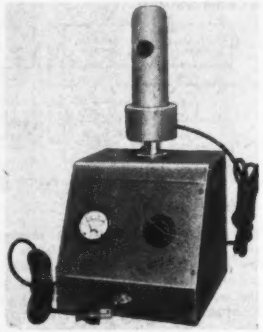
One lamp gives line spectrum through near infrared to ultraviolet . . .

uses twelve interchangeable bulbs with filter to isolate individual lines

Uses: Providing line radiation for laboratory applications in optics, radiation physics, spectroscopy.

Features: Twelve interchangeable bulbs produce line spectrum from short wave ultraviolet through visible into the near infrared.

Description: Lamps are equipped with prefocus bases and identical light center lengths for handling ease. Bulbs can be changed without changing source position. Twelve bulbs provide spectrum of cadmium, caesium, helium, mercury, mercury-cadmium, potassium, sodium, neon, rubidium, thallium, zinc. Mercury lamp has a window-like opening in the outer bulb for short wave ultraviolet. Individual lines may be isolated by use of a filter. Unit uses 110-120v AC, 60 cps. Lamp house can be raised to desired height or demounted for remote use. Control knob adjusts current supplied to each lamp at proper value. Meter indicates lamp current.



Bulb housing on top of lamp base can be demounted for remote use

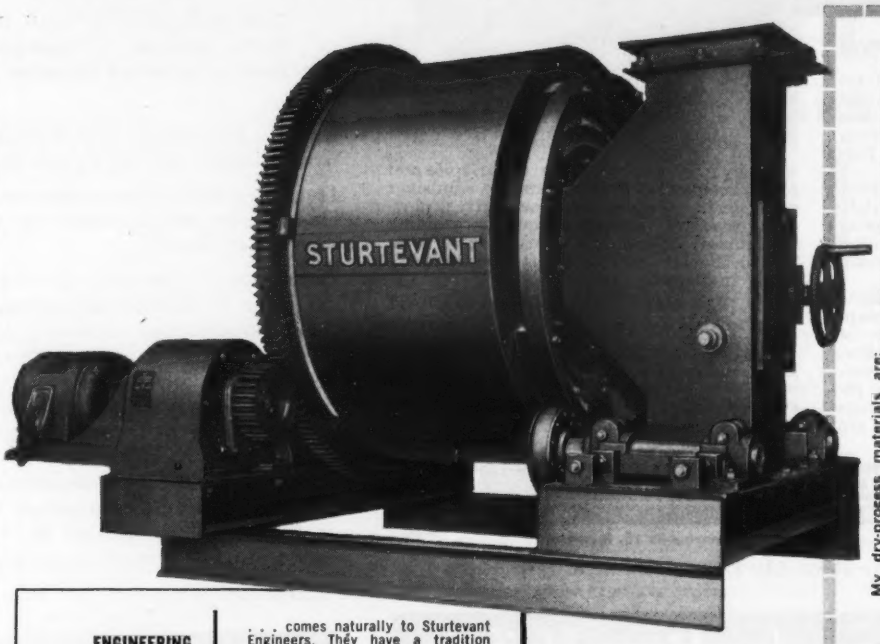
(Spectral Omnirange Lamp is product of George W. Gates & Co., Inc., Dept. CP, Hempstead Turnpike & Lucille Ave., Franklin Square, Long Island, N. Y. Check CP 5459 opposite last page.)

Features micro-metering from 0.2 ml/hr

Describing peristaltic-action pumps for flow control, four-page bulletin in two colors includes diagram to illustrate principle of operation. Pump described operates through movement of a series of rollers along a length of flexible tubing. Pumping range of one pump described is from 0.2 ml/hr to 50 ml/min. Second pump described has range from 25 ml/min to 600 ml/min.

Bulletin 2264 is issued by American Instrument Co., Inc., Dept. CP, 8030 Georgia Ave., Silver Spring, Md. When inquiring specify CP 5460 on form opposite last page.

COSTS OF BETTER BLENDS CUT TWO TESTED WAYS



ENGINEERING BLENDING AND OTHER DRY PROCESSES TO SPECIFICATIONS

. . . comes naturally to Sturtevant Engineers. They have a tradition of solving dry-processing problems since 1873. Sturtevant custom-built equipment and plants are well-known for their low-maintenance-cost operation. If your problems include any of the processes listed on the coupon, it will pay you to investigate.

Sturtevant Dry-Batch Blenders:

1. **SPEED UP PRODUCTION WITH 4-WAY MIXING**
2. **SHORTEN SHUT-DOWNS WITH "OPEN-DOOR" DESIGN**

Batches from 500 to 40,000 pounds come out of Sturtevant Dry-Batch Blenders exactly as you want them. They are completely blended regardless of the varying weights, densities or fineness of the different ingredients. And no dust is lost in the process. **Four different vertical and lateral mixing actions** inside the sealed rotating drum achieve thorough blending in minimum time. Single lever control of a single gate speeds up loading and discharging.

"Open-Door" accessibility makes cleaning and maintenance a matter of minutes. This original Sturtevant advantage plus 75-year-tested rugged construction assures more output per machine-year. Check the coupon for more information.

STURTEVANT

Dry Processing Equipment

The "OPEN-DOOR" to *lower* operating costs over *more* years

CRUSHERS • GRINDERS • MICRON-GRINDERS • SEPARATORS
BLENDERS • GRANULATORS • CONVEYORS • ELEVATORS

My dry-process materials are:_____

Desired capacity is:_____

Name_____ Title_____

Firm_____

Street_____

City_____ Zone_____ State_____

STURTEVANT MILL COMPANY, 119 Clayton Street, Boston 22, Mass.

Please send me your bulletin on Dry Blenders ☐
Also bulletins on machines for:

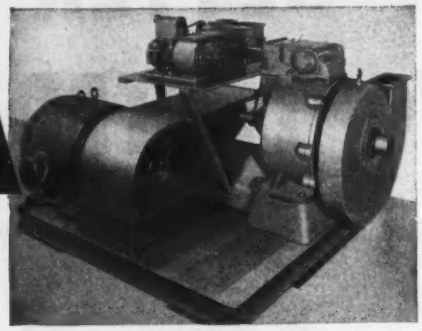
☐ CRUSHING ☐ GRINDING ☐ PULVERIZING
☐ MICRON-GRINDING ☐ SEPARATING ☐ BLENDING
☐ SUPERFINE SELECTING ☐ GRANULATING ☐ CONVEYING

When inquiring check CP 5461 opposite last page

Do You Need ULTRAFINE GRINDING?

FOR UNEXCELLED QUALITY WITH CONTROLLED PARTICLE RANGE

use a **SCHUTZ-O'NEILL PULVERIZER**



Backed by 63 years experience!

If your product must be pulverized to ultrafine specifications and yet have controlled particle size distribution, you'll find proven Schutz-O'Neill "Superfine" Pulverizers best for the job.

Many products that are heat sensitive can be pulverized safely too, because the grinding principle of impact with air attrition keeps product temperatures down and helps control humidity.

Versatility of the Superfine Pulverizers makes them adaptable to the complete range of grinding from coarse to ultrafine. Schutz-O'Neill Superfine Pulverizers are used in the paint industry where ultrafine pigments with close particle size range are vital; by major cocoa powder, sugar, spice and pharmaceutical manufacturers; for emulsifier gums, resin, plastic and seaweed extract powders—wherever unexcelled quality grinding is required. Offered in 6 sizes ranging from 7½ to 125 HP with grinding chambers 12" to 28" in diameter.

FREE TEST GRIND OF YOUR PRODUCT in our test lab! Tell us your milling requirement—fineness, uniformity, increased output, lower cost—send us a sample of the stock you want to pulverize, state fineness and capacity desired. You'll receive back your processed product plus our Engineering Test Report—there's no obligation.

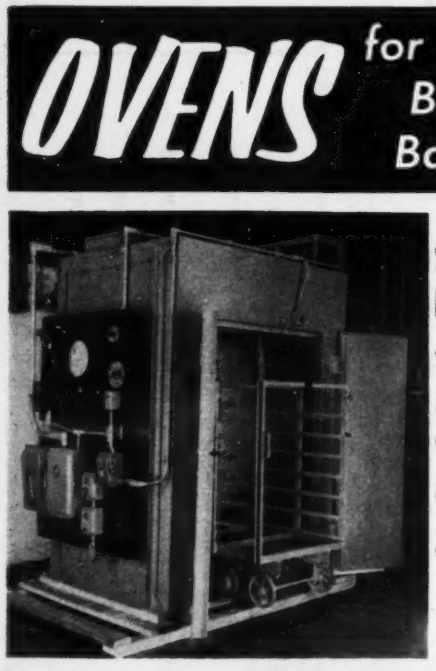
Send for literature on Schutz-O'Neill Pulverizers

ESTABLISHED 1893 **SCHUTZ-O'NEILL COMPANY**

343 Portland Avenue • Minneapolis 15, Minnesota

When inquiring check CP 5462 opposite last page

OVENS for More Uniform Better Drying Baking · Curing



Save Space and Time Reduce Operating Cost

- Batch types — tray, rack or truck loading; standard and special.
- Conveyor types—belt, carrier, etc.
- Heating — electric, gas, steam or oil, with positive air recirculation.
- Accurately controlled processing temperature.
- Rugged, insulated steel or stainless steel panel construction.

Write for Catalog

ROCKWELL SINCE 1888 BUILT

W. S. ROCKWELL COMPANY

BUTTERFLY VALVES • SLIDE VALVES • AUTOMATIC VALVES

2205 ELIOT STREET • FAIRFIELD, CONN.

Sales Representatives in Principal Cities

When inquiring check CP 5463 opposite last page

Infrared spectrometer can be operated by anyone

Once instrument has been set up properly, routine analyses are made by "push button"; even by untrained personnel

Uses: Fast and accurate qualitative and quantitative chemical analyses by infrared.

Features: Infrared spectrophotometer has double-beam, double-monochromator optical design with push-button control.

Description: Infrared spectrophotometer has advantage of double-beam system — fast, high-resolution scans, and convenient data presentation — plus spectral purity and extra resolution of double-monochromator. Twice dispersion and twice the energy is provided by double-monochromator over a comparable single-monochromator. For most accurate quantitative work, instrument may be operated single-beam. Refinements for single-beam operation include regulated glower, linear amplifier with 40 db of negative feedback, and 0.1% precision potentiometer to control recorder pen.

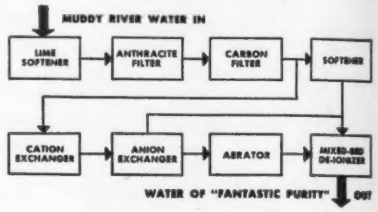
Infrared spectrophotometer can be operated by untrained personnel

Different optical materials can be used in instrument with interchangeable units, kinetically mounted. Each unit is complete with prisms, aligned Littrows, wave length cams, and wave length dials. Optical materials can be changed without necessity of adjustments.

Recorder is mounted so chart paper travels horizontally. Normal quantitative analyses are run on a standard pre-printed 1-16μ which repeats every 36 inches. As each curve is completed, instrument automatically realigns chart paper for next run. Instru-

ILLCO-WAY ionXchange

HOW TO UN-MUDDY THE WATERS



This block diagram shows a typical arrangement for a power company steam plant that must draw its boiler feed water from a nearby muddy river. The Lime Softener takes out suspended solids, turbidity, alkalinity, and organic matter; the Anthracite Filter removes any remaining turbidity; the Carbon Filter removes the chlorine; the Softener provides process water; the Cation and Anion Exchangers remove the dissolved solids such as carbonates, sulfates, and chlorides; the Aerator takes out most of the CO_2; and the Mixed-Bed De-Ionizer eliminates the remaining 4 or 5 ppm of solids, silica, and 5 ppm of CO_2 — to produce water of "fantastic purity."

ILLCO-WAY PIONEERS IN PRACTICAL EXPERIENCE

Illinois Water Treatment Company designs and builds *complete, practical, workable systems* such as that shown above — to operate economically on a cost-reducing basis. This work is based on a wealth of practical knowledge gained through constant experience in the specialized field of ion-exchange, starting from the time that the first workable resins became available.

Remember ILLCO-WAY—foremost in the field of ionXchange.

ILLINOIS WATER TREATMENT CO.

ionXchange

ILLCO-WAY

840 CEDAR ST. ROCKFORD, ILLINOIS

NEW YORK OFFICE: 141 E. 44TH ST., NEW YORK 17, N.Y.

CANADIAN DIST: PUMPS & SOFTENERS, LTD. LONDON, ONT.

When inquiring check CP 5464 opposite last page

ment can be operated by anyone who knows only how to insert a sample, once instrument has been set up by technician.

Operation requires only that the start button be pressed. Instrument not only runs curve unattended but stops automatically at starting point for next run. Each successive run requires only changing samples and pushing button. Control knobs can be covered by sliding panel to prevent accidental changing of settings.

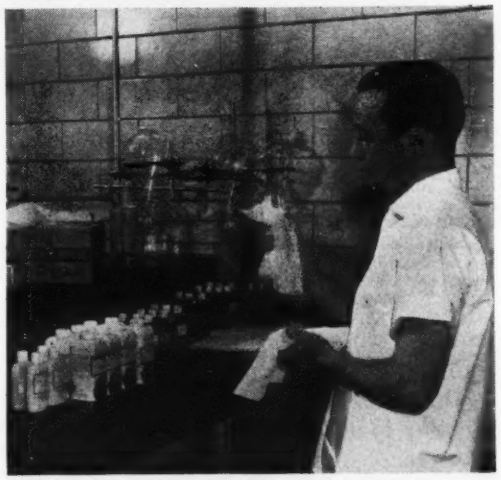
(IR-4 Infrared Spectrophotometer is a product of Beckman Div., Beckman Instruments, Inc., Dept. CP, 2500 Fullerton Rd., Fullerton, Calif. . . . or for more information check CP 5466 opposite last page.)

Disposable paper wipers for laboratory use are lint-free . . .

have embossed surface for easy pickup of liquids, powders, small particles

Uses: As disposable wipers for cleaning glassware, table tops, mopping up spillages, and personal wiping of face and hands.

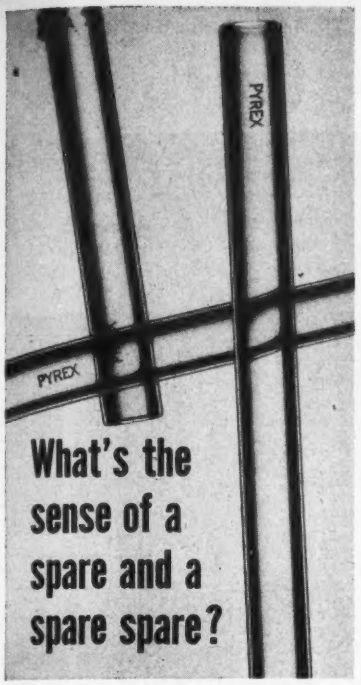
Features: Paper wipers are soft and lint-free with embossed surface for easy pickup of liquids, powders, and small particles.



Using lint-free paper wipers for cleaning of glassware

Description: Disposable industrial paper wipers are two-ply sheets available in two sizes, 9⅝ x 13⅝" and 9⅝ x 10¼". Wipers are packed in boxes with a "pop-up" availability, each box containing 125 wipers.

(Scott Wipers are product of Scott Paper Company, Dept. CP, Front & Market St., Chester, Pa. Check CP 5467 opposite last page.)



Save money on gauge maintenance. Always keep two gauge glasses "on the bench" for every one in use.

You save time when replacements become necessary, because:

Spare No. 1 is right at hand for immediate replacement during routine cleaning and maintenance of the gauge.

Spare No. 2 is ready for sudden emergencies. Provides quick replacement in case of breakage at night, for example, when your Industrial Distributor may not be open.

Play safe and smart on *all* your visual inspection problems. Call your Industrial Distributor, and order *extra* gauge glasses for all your vessels.

Remember: "ONE FOR THE GAUGE AND TWO FOR THE SHELF." And always specify hard-to-break CORNING®, PYREX® and MACBETH® gauge glasses. It's the economical way.

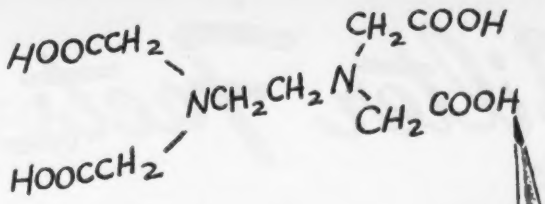
CORNING INDUSTRIAL GLASSWARE FOR EVERY JOB

Application	*Recommended Product*
Normal Conditions (Up to 100 p.s.i.)	CORNING brand standard gauge glasses
Higher temperatures	PYREX brand high-pressure gauge glasses
Higher pressures	PYREX brand heavy-wall gauge glasses
Extra visibility	PYREX brand red-line gauge glasses
Viewing inside furnaces, reactors pressure vessels, etc.	PYREX brand sight glasses
Lubrication inspection	PYREX brand lubricator glasses
Visible discharge devices	PYREX brand oil cup glasses

CORNING GLASS WORKS
Corning, New York

Corning means research in Glass

When inquiring check CP 5465 opposite last page



FOR THE PUREST EDTA

USERS DEMAND

TETRINE®

SEQUESTERING AGENTS

Using the purest materials available has several advantages. In some processes, any foreign materials have harmful effects, and must be cut to an absolute minimum. And in all processes, extra purity gives more mileage—you get more active material for your money. This is why it will pay you to use Glyco's 99+% active sequestering agent, the purest EDTA available commercially. No foreign materials are present. You pay no premium for added activity.

Effective against a wide range of di- and trivalent metal contaminants, this EDTA is stable to storage and to all temperatures and pHs commonly encountered. It chelates efficiently in high concentrations and extreme dilutions of metal ions.

These are some of the industries which use one or more of the TETRINE sequestering agents—Glyco's EDTA and its salts:

Textile	**Germicide**
Soap	**Latex**
Detergent	**Leather**
Rubber	**Metals**
Cosmetic	**Pulp & Paper**

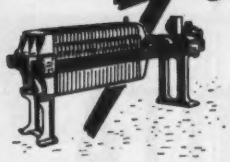
Our modern plant is especially designed for the manufacture of the TETRINES. This plant, these products, our experienced personnel—all are geared to the elimination of your contaminant troubles. Send for samples and catalog.

GLYCO
PRODUCTS CO., INC.
Empire State Building
New York 1, N. Y.

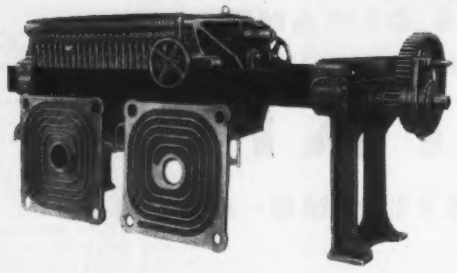
NONIONIC SURFACTANTS • SYNTHETIC WAXES • EMULSIFYING AGENTS

When inquiring check CP 5468 opposite last page

Filter Facts



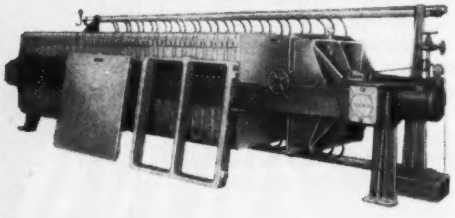
SHRIVER
Developments and Improvements for Better Processing



Continuous Thickener

Bulletin 122

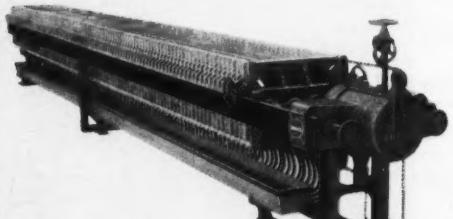
Uses—Washing slurry to remove impurities, especially from slow-settling materials, saving considerable time and equipment. • Thickening prior to filtration. • Thickening instead of filtration. • Decantation involving "fines." "A lot of thickening in a small space."



Chamber Type Plastics Reactor

Bulletin 142

Polymerizes plastic resins at controlled rate of heating and cooling to produce multiple slabs of finished product of any desired size, 12" to 56" square, from 1" to 5" thick.



Wax Molding Press

Bulletin 127

Cools and molds paraffin or natural wax, or other substances, into multiple cakes of uniform size, weight and appearance, without shrinkage.

T. SHRIVER & COMPANY, Inc.

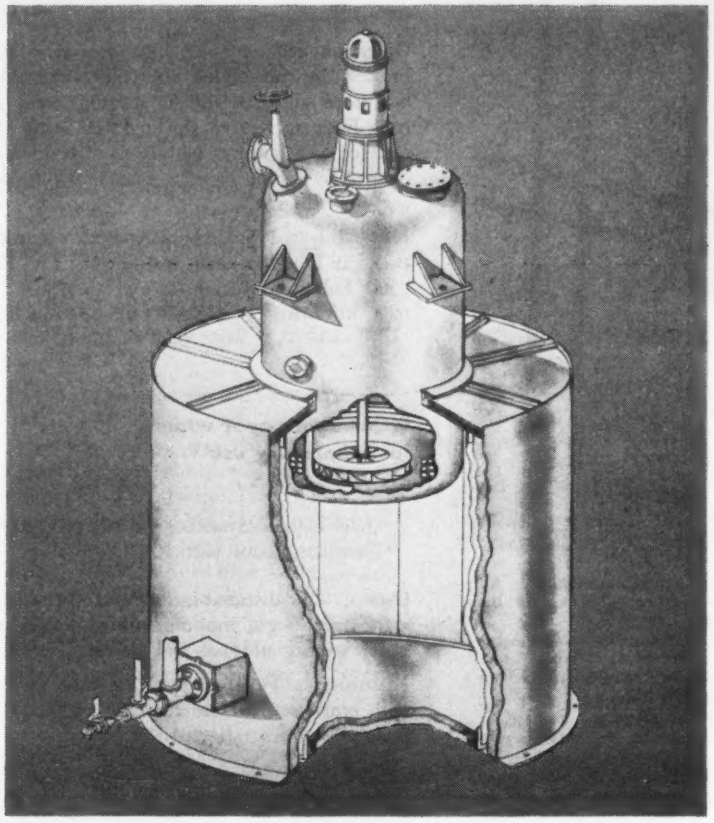
Filter Presses · Filter Media · Diaphragm Pumps

846 Hamilton St., Harrison, N. J.

Sales Representatives in
Decatur, Ga.—Houston, Tex.—St. Louis, Mo.
San Francisco—Montreal—Toronto

When inquiring check CP 5469 opposite last page

processing equipment



Radiant furnaces at Pratt & Lambert, Inc., provide fast, efficient process heat, and . . .

CUT FUEL COSTS BY

Kettles suspended in furnaces; over 75 per cent of heat supplied by radiation

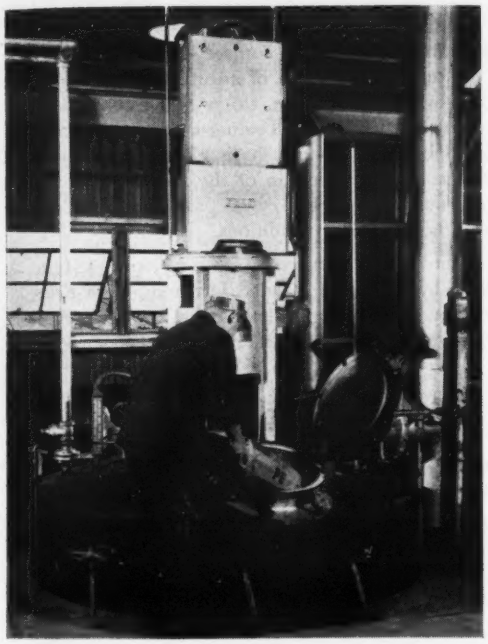
RADIANT-heating furnaces of a new design are proving their superiority over conventional direct-fired furnaces at Pratt & Lambert, Inc., Buffalo, N. Y. Installed at the company's 7000-gal-capacity oil-bodying and alkyd resin plant, the three furnaces (one for each kettle) have been in operation about four years — ample time for sufficient evaluation.

Operational data compiled since installation indicate that the furnaces operate on at least one-third less fuel than was previously used in similar processing in older direct-fired set kettles. The new furnaces heat 2000 gal of oil from 70°F to 575°F in less than five hours and drop from 575°F to 450°F in 15 minutes. Furnaces can come up to full operating temperature from a cold start in less than 10 minutes, compared to one and one-half hours for a similarly-sized conventional furnace. Unit will cool to "black" from a maximum operating temperature within 30 seconds after fuel supply is cut.

Furnace is constructed of a large chamber of

Drawing shows how heated vessel (top) is suspended in radiant furnace (bottom). Burners are mounted tangentially near base of furnace

Operator charging 2000-gal vacuum kettle in oil-bodying and alkyd resin plant. Furnaces are located on floor below

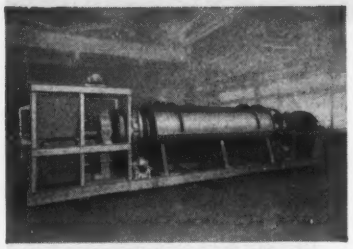


S BY 1/3

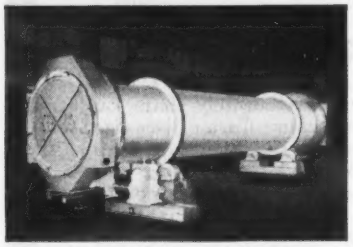
light-gage stainless steel surrounded by a high-temperature, lightweight insulating material. The heated vessel is suspended in the furnace (as shown in accompanying drawing) in such a manner that radiant heat absorption is very effective for the entire surface located within the furnace. Burners are mounted tangentially near base of furnace to produce a vortex of luminous flame. Burners normally operate with little more than the theoretical amount of air. While the units at Pratt & Lambert are oil-fired, furnaces of this type are said to operate with equal efficiency when fired with gas.

Efficient use of heat, coupled with low heat loss (in full operation, outside surface of furnace is hardly

(*Please turn to next page*)



Indirect Heat Rotary Combination Calciner and Cooler for Processing Catalyst in Hydrogen Atmosphere.



Special 60" Dia. by 32'0" Stainless Steel Dryer for Processing Plastics without Color Contamination.

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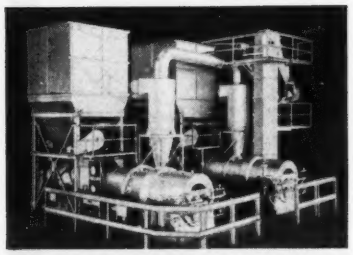
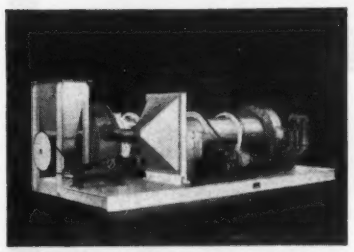


Two Completely Self-Contained Drying Systems Operated Singly or Together—Showing Materials Handling and Dust Collection Facilities.



Specially Designed Drying Unit that Removes Organic Solvent from Newly Developed Antibiotic.

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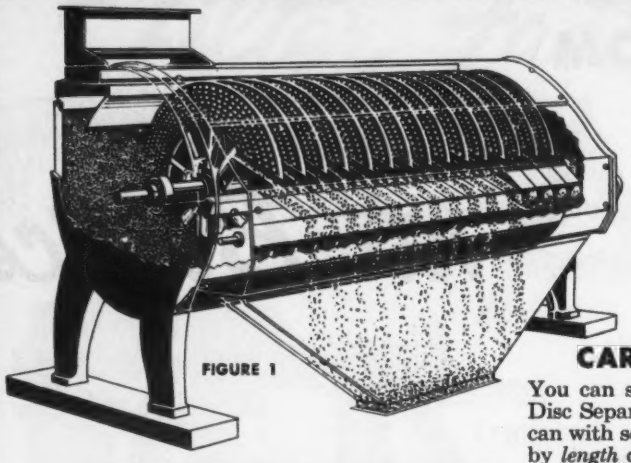


FIGURE 1

FIGURE 2

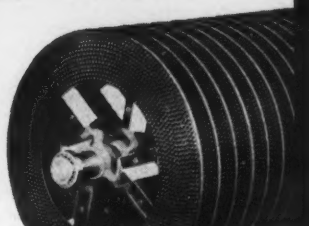


FIGURE 3

FOR ACCURATE LENGTH SIZING OF FREE-FLOWING GRANULAR MATERIALS

CARTER DISC SEPARATORS

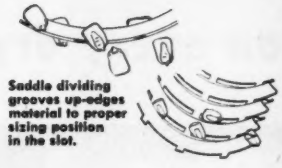
You can size free-flowing materials with Carter Disc Separators much more accurately than you can with screens. That's because Carter discs size by *length* differences. In each disc there are hundreds of under-cut pockets which lift short material and reject long material that does not fit into the pockets. Fig. 1 shows how material flows through the Disc Separator. Fig. 2 shows how the discs lift or reject. A series of discs is shown in Fig. 3. Sizes of Carter Disc Separators differ in the number of discs and in the diameter of the discs, and there is a wide range of pocket sizes and styles.

HART UNI-FLOW CYLINDER SEPARATORS

While *Disc* Separators perform *precise* separations, Uni-Flow *Cylinder* Separators are recommended when you need less accuracy or more flexibility. In the Uni-Flow Separator the material is lifted by semi-spherical indents (A) that line the inside surface of the cylinder. The operator controls the separation by raising or lowering the separating edge (C) of the trough (B) into which the lifted material falls.

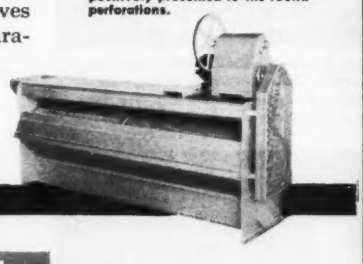
CARTER PRECISION GRADERS For Sizing by Thickness or Width

Because of the unique design of the perforated cylinders used in Carter Precision Graders, these machines make separations to a degree of accuracy hitherto unobtainable. Thickness separations are made by slots at the bottom of grooves in the cylinder. Width separations are made by recessed round perforations in the cylinder.



Saddle dividing grooves up-edges material to proper sizing position in the slot.

Placing the perforation at the bottom of the recess causes the material to be up-ended and positively presented to the round perforations.



FREE TESTING You are invited to send—or bring—samples of your materials to the Hart-Carter laboratory for free testing. (Ask us about the size sample required.) Results will be kept confidential. Knowing your requirements, Hart-Carter will recommend the machines you need. Hart-Carter machines are being used to size such materials as polyethylene and nylon cubes, and catalyst pellets. *WRITE FOR FOLDERS that describe in detail the sizing methods used by each kind of machine.*

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MACHINERY FOR SIZING FREE-FLOWING GRANULAR MATERIALS BY DIMENSIONAL DIFFERENCES

When inquiring check CP 5471 opposite last page

Cut Fuel Costs

(*Continued from preceding page*)

warm to the touch), accounts for the unit's relatively low fuel consumption. Rapid heat transfer is obtained without the development of local hot spots and consequent discoloration of product. Since more than 75 per cent of the heat applied to the kettles is from radiation, the furnaces respond rapidly to either manual or automatic temperature controls.

Initial investment cost of furnace is said to be about 50 per cent less than that of an indirect heating system providing the same close degree of control necessary for heating and cooling heat-sensitive materials. Substantial savings have also been reported due to automatic operation of the furnaces and auxiliary equipment, larger batch production, and improved housekeeping conditions.

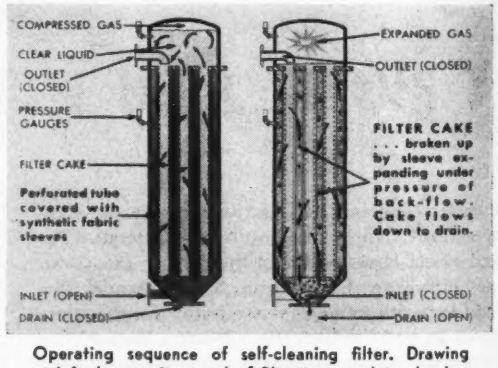
(Radiant-heating furnaces were developed and installed by Chemical Plants Division, Blaw-Knox Company, Dept. CP, Farmers Bank Building, Pittsburgh, Pa. . . . or check CP 5472 opposite last page.)

Tubular filter cleans itself — needs no back-wash pumps or other devices . . .

trapped air causes back-surge, dislodging cake and forcing it out the drain

Uses: Filtering operations in chemical plants.

Features: Filter is self-cleaning, requiring no back-wash pumps or other devices. Unit has vertical design, occupying minimum floor space.



Operating sequence of self-cleaning filter. Drawing at left shows unit at end of filtration—outlet valve has been closed, unit is ready for cleaning. Sketch at right illustrates cleaning action

Description: Consists of a series of perforated metal tubes mounted inside vertical shell. Influent passes through walls of tubes covered with synthetic fabric. Pre-coating, when needed, is done in conventional way.

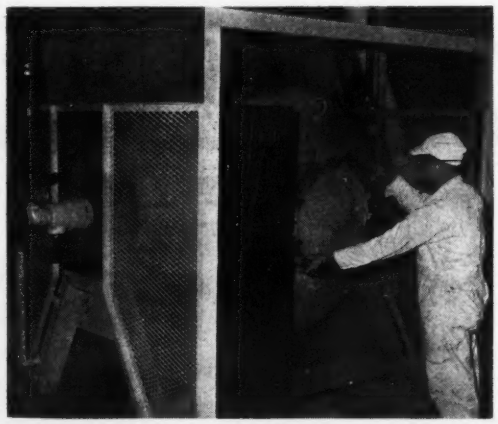
Cleaning procedure is extremely simple. Outlet valve is closed, building up pressure on entrapped air. When pressure reaches predetermined point, quick-opening valves simultaneously shut off the inlet and open drain. The compressed air instantly causes a violent back-surge that expands the tube covers, dislodges filter cake, and forces it out the drain in a matter of seconds.

(Hydra-Shoc filters are product of Industrial Filter and Pump Mfg. Co., Dept. CP, 5916 Ogden Ave., Chicago 50, Ill. Check CP 5473 opposite last page.)

Danger of contamination minimized with glass-lined conical dryer . . .

non-sticking properties of glass reduce handling and product losses

Non-corrosive, glass-lined conical dryer has two principal advantages. It minimizes danger of contamination and provides ease of handling and reduced product losses due to the non-sticking properties of the glass. Units are adaptable to uniform short-cycle drying needs and are suitable for handling heat-sensitive materials. Low drying temperatures can



Glass-lined dryer-blender in operation at a large chemical plant in the Chicago area

be obtained by using hot water in the jackets. Continuous exposure to new surface shortens drying cycle and prevents over-drying and caking of material.

Glass-lined dryer-blenders are available in 5 to 35 cu ft capacities and can be obtained in larger sizes if required. Operating temperatures are 500°F in liner and 650°F in jacket. With tank at full vacuum, operating pressure is 25 psi and pressure in jacket is 65-75 psi.

(Glass-lined dryer-blender is product of Glascote Products, Inc., Subs., A. O. Smith Corp., Dept. CP, 20900 St. Clair Ave., Cleveland 17, Ohio . . . or for more information check CP 5474 opp. last page.)

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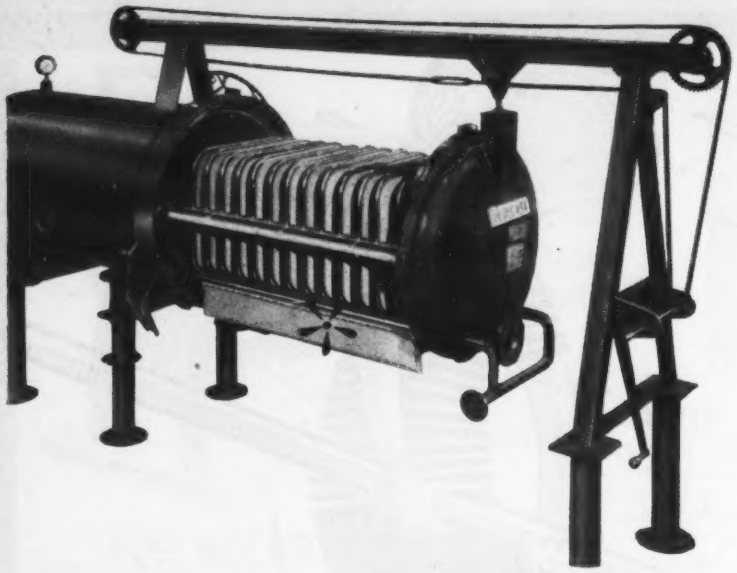
When inquiring check CP 5475 opposite last page



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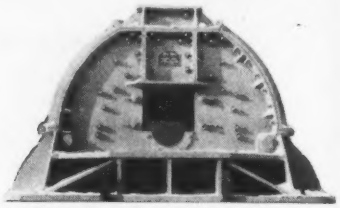

Bearings on large crusher are adjusted, removed, and replaced hydraulically

cement mills and other industrial applications, huge reversible impact mill has these features.

1) Synchronized adjustment of upper and lower concentric breaker blocks to attain maximum control of product size and longer life of wearing parts. 2) Hydraulic method of adjusting, removing, and replacing bearings. 3) Use of heavy internal flywheel end discs for safer operation and decreased consumption of power. 4) Improved distribution of weight in hammers to secure maximum crushing energy with minimum discard of metal.

(Hy-Ton crushers are product of Crusher Engineering Division, Poor and Company, Dept. CP, 400 Architects Bldg., Philadelphia 3, Pa. Check CP 5477 opp. last page.)

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Cat 150 is issued by Universal Vibrating Screen Co., Dept. CP, Deane Blvd. & St. Paul Railroad, Racine, Wis. Specify CP 5478 opposite last page.

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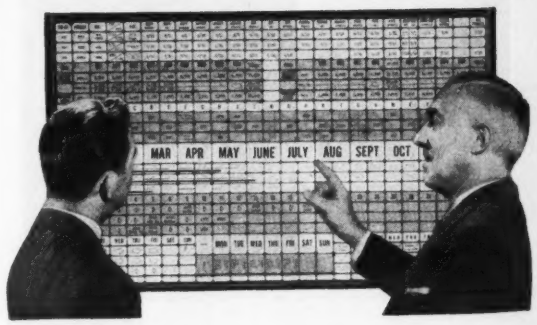

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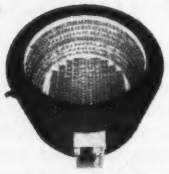

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Bul "Wheelabrator Mechanical Plastics Deflashing" is issued by Wheelabrator Corporation, Dept. CP, 1036 S. Byrkit St., Mishawaka, Ind. Specify CP 5483 opposite last page.

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Features: Basic design is similar to large glass-lined reactors, so that parallel results may be anticipated in working from laboratory to pilot plant to full-scale production.

Description: Units range in capacity from five to 100 gal. Standard low-pressure reactors withstand 25-30 psi. High-pressure units are rated at 150 psi. Glass lining is resistant up to 212°F to all concentrations of all acids except hydrofluoric, and to all alkalis up to pH of 12. Many acid solutions up to 450°F can be processed. Units with special gaskets can be used as high as 600°F.

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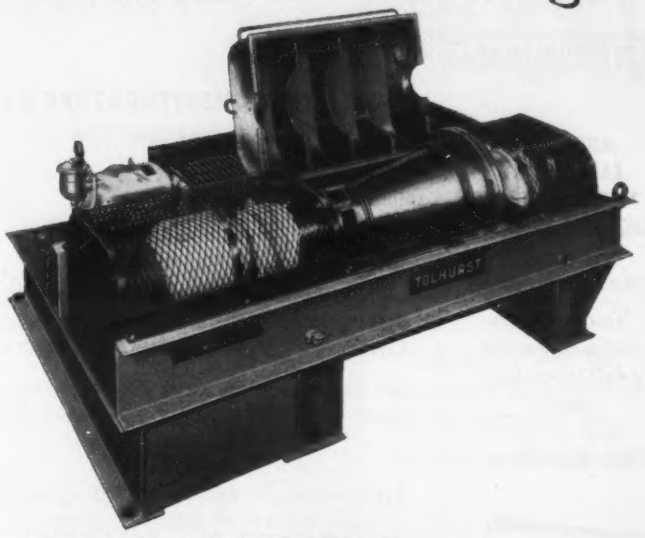
("P" series reactors are product of The Pfaudler Company, Dept. CP, 1000 West Avenue, Rochester, N. Y. . . . or for more information check CP 5484 opp. last page.)

new model continuous centrifugal



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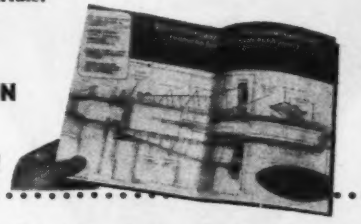

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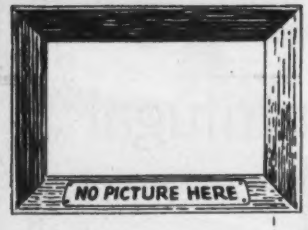

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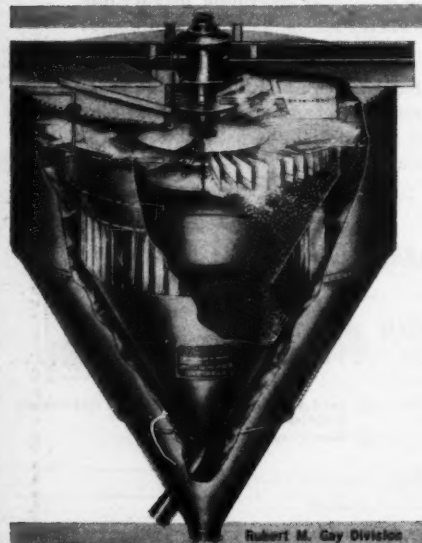
When inquiring check CP 5486 opposite last page

USING SCREEN SEPARATIONS? NOTHING CLASSIFIES AS PERFECTLY AS AIR



GAYCO
CENTRIFUGAL AIR SEPARATORS

Classify practically all dry fine materials

You get:
- CLOSER SEPARATIONS
- IMPROVED PRODUCTION —fines removed as they are made.
- NO UNDESIRABLE OVERSIZE.

RANGE 60 to 400 mesh. Timken bearings. Choice of Standard or Heavy Duty Models.

Send now for Catalogue and Studies in separating of various materials.

Robert M. Gay Division
UNIVERSAL ROAD MACHINERY CO.
117 Liberty St., New York 6, N. Y.
Factory and Laboratory: Kingston, N. Y.

When inquiring check CP 5487 opposite last page

PROCESSING

Only one moving part on pedestal sifter

Single sieve, two-separation sifter for handling free flowing materials is described in two-page bulletin. Unit has only one moving part — the balance weight shaft which rotates in sealed ball bearings. Sifter can be furnished with casters for mobility, or column for floor, ceiling, cabinet mounting.

Bul 139 is issued by Sprout-Waldron & Co., Inc., Dept. CP, Muncy, Pa. Specify CP 5488 opposite last page.

Describes ore, rock, sand washing equipment

Steel log washers designed for removing clay, soft rock, and other refuse from sand, gravel, ore, and rock are the subject of eight-page bulletin. In addition to technical details on construction and operation, literature features charts giving dimensions for various washers.

Bul "McLanahan Log Washers" is issued by McLanahan & Stone Corporation, Dept. CP, Hollidaysburg, Pa. Specify CP 5489 opposite last page.

Twin adsorption towers on gas dryers . . .

permit continuous drying

Uses: Dehydrate compressed air and other gases to a dew point of −50°F or lower.

Features: Dryers automatically alternate the compressed gas stream between twin adsorption towers, one dehydrating the gas while the adsorbent in the other is being reactivated.

Description: Six standard models are available for different flow requirements and operating conditions found in wide variety of laboratory and industrial uses. Other units are available for high pressures.

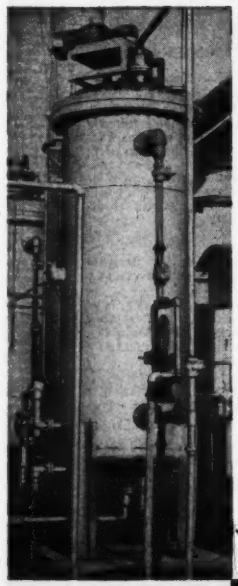
J. E. SIRRINE CO.
GREENVILLE • SOUTH CAROLINA

Engineers
ESTABLISHED 1902

PLANT DESIGN & SURVEYS • CHEMICAL • ELECTROCHEMICAL • METALLURGICAL PRODUCTION • TRADE WASTE DISPOSAL • WATER SUPPLY & TREATMENT • ANALYSES & REPORTS

When inquiring check CP 5490 opposite last page

Efficient/Practical
SOLVENT EXTRACTION AT *LOW* COST



The York-Scheibel multi-stage extraction column is ideal for simple counter-current extraction; and for fractional liquid extraction in which the feed material is simultaneously contacted by two selective and immiscible solvents.

Check these features . . .
- **POSITIVE MIXING**
- **POSITIVE PHASE SEPARATION**
- **SINGLE, COMPACT COLUMN**
- **HIGH THROUGHPUT CAPACITY**
- **HIGH EFFICIENCY**
- **LOW STAGE HEIGHT**
- **LOW COST PER STAGE.**

YORK
YORK PROCESS EQUIPMENT CORP.
4 Central Avenue
WEST ORANGE, N. J.

Complete illustrated catalog available describing laboratory, pilot plant and large scale extraction columns.

When inquiring check CP 5491 opposite last page

3 WAYS
SPERRY CUSTOM FILTRATION
. . . HELPS YOU!

Experience – SPERRY OFFERS YOU the knowledge gained thru 88 years designing and constructing thousands of filter presses for hundreds of industries.

Equipment – SPERRY OFFERS YOU a complete selection of the finest filter presses, standard or special . . . all types and sizes of filter media . . . plus the widest selection of closing devices and other time-savers—for all types of industrial filtration.

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When inquiring check CP 5492 opposite last page

7-WAY ACTION
. . . for better, faster blending

It lifts . . . blends . . . mixes . . . seven ways, assuring faster, more accurate blending of dry ingredients. Empties completely. Will not grind or reduce particles. Ideal for blending of fertilizers, insecticides, fibrous materials, pharmaceuticals, atomic materials, chemicals, and a wide variety of other ingredients. Can be fitted with internal liquid spray pipe. Gravity intake and discharge with no internal bearings for free-flowing materials.

MUNSON
ROTARY BATCH MIXER

For details write to:
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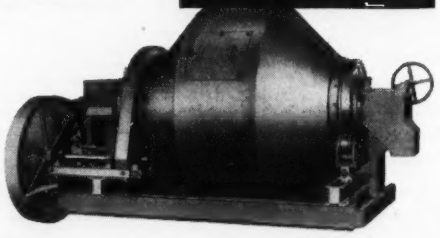
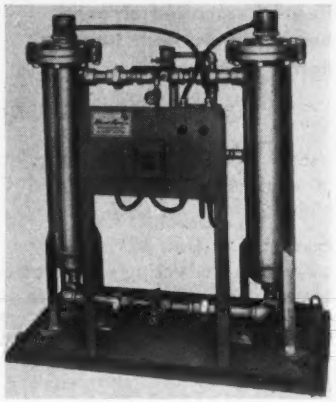


When inquiring check CP 5493 opposite last page



Dryers dehydrate compressed air, other gases

(Compressed-gas dryers are product of Kahn and Company, Inc., Dept. CP, 543 Windsor Street, Hartford 1, Conn. . . . or for more information check CP 5494 on form opposite last page.)

"Try burping, Charlie!"

Thanks to Ray Shannon for this funny. Ray is compressor operator in the Nitrous Oxide Dept. of the Thomas A. Edison Medical Gas Div., Stuyvesant Falls, N.Y.

PARTICLE SIZE REDUCTION BY IMPACT!

Illustrated below is the CONTINUOUS RECORD SCRAP GRINDING SYSTEM . . . engineered by the ENTOLETER DIVISION in conjunction with the engineering department of CAPITOL RECORDS, Inc. for Capitol's Scranton plant.

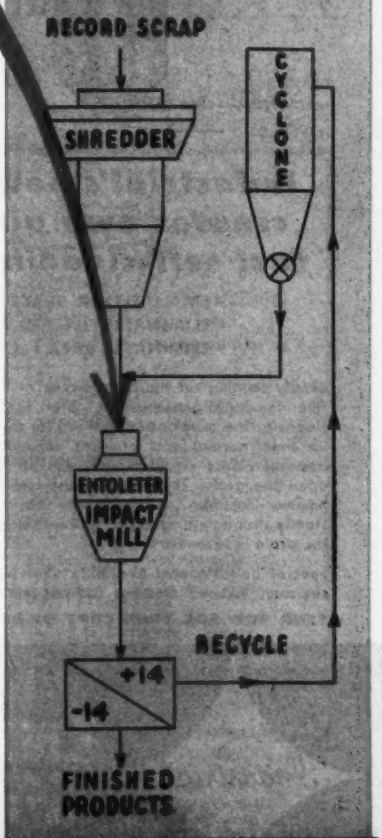
This efficient installation combines . . .

- **PNEUMATIC CONVEYING EQUIPMENT**
- **SEPARATING EQUIPMENT**
- **AN "ENTOLETER" IMPACT MILL**

assuring high production with these advantages . . .

- **2500 pounds of desired product per hour**
- **a total requirement of less than 50 H.P. for the entire system**
- **the grinding operation produces less than 12° F. product temperature increase**

New "Entoleter" Impact Mill applications are being developed continually in our laboratory in New Haven. Contact us today about your grinding system problem!

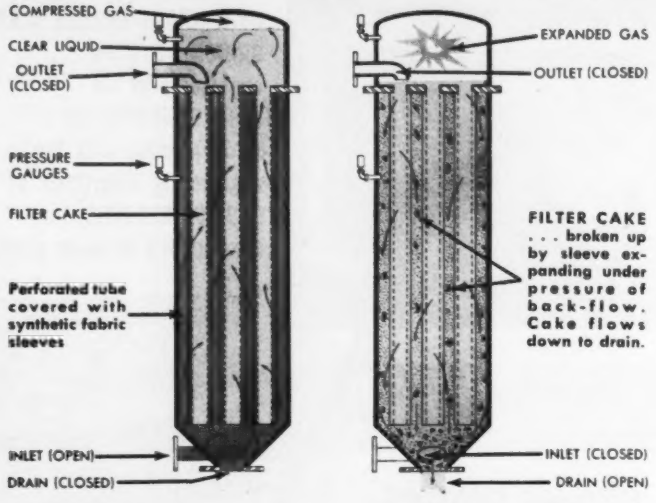


ENTOLETER DIVISION
The Safety Car Heating and Lighting Company, Inc.
1199 Dixwell Ave., New Haven 4, Connecticut

When inquiring check CP 5495 opposite last page

NEW! Hydra-Shoc* SELF-CLEANING FILTER

*Trade Mark



Industrial's new tubular filter creates own air pressure for fast self-cleaning in seconds...

- SMALL FLOOR SPACE
- ELIMINATES FILTERED WATER FOR CLEANING
- ELIMINATES BACK FLOW PUMPS

Simply shutting off the outlet valve at the end of a filtering cycle prepares the filter for Hydra-Shoc cleaning. The air trapped in the filter chamber builds up under normal input pressure. Then a set of quick opening valves simultaneously shut off the inlet and open the drain. The air, suddenly released with a hammer-like blow, expands the fabric sleeves, instantly dislodging, and forcing the filter cake through the drain in seconds.

Special bulletin now available showing operating sequence, sectional drawings and principle of operation.

SEND NOW FOR YOUR COPY OF BULLETIN NO. 114-1155.

CENTRIFUGAL PUMPS · PRESSURE FILTERS · ION AND HEAT EXCHANGERS · RUBBER LININGS · WASTE TREATING EQUIPMENT

INDUSTRIAL

Industrial

FILTER & PUMP MFG. CO.

5908 OGDEN AVENUE · CHICAGO 50, ILLINOIS

When inquiring check CP 5496 opposite last page

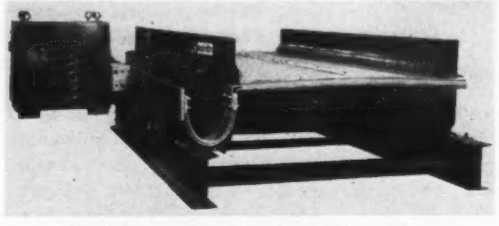
Heated vibrating screen has minimum heat loss, better efficiency . . .

designed for no induction heating of side panels

Uses: Screening damp, sticky, difficult materials in applications where heat will prevent screen blinding.

Features: Unit has current applied so there is no inductance heating of side plates, more efficient heating, and minimum heat loss.

Description: Screen has 35 sq ft of screening area. Fully-balanced, high-speed, short-stroke assembly provides vibration equally distributed over entire deck area. Screen's transformer is dust-tight, specifically designed for screen heating. It can



Heated screen has 35 sq ft screening surface

heat either stainless or carbon steel cloth. Heat is distributed evenly throughout screen at minimum operating current. Unit includes built-in overload switch to protect transformer from burning out.

(Model SS heated screen is product of Simplicity Engineering Company, Dept. CP, 1939 Ralph St., Durand, Mich. Check CP 5497 opp. last page.)

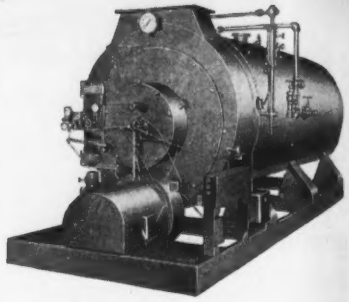
Laminating press makes 5" panels at rate of 15 to 30 fpm . . .

vertical alignment of rolls insures excellent bonds, regardless of panel thickness

Uses: Unit will satisfactorily bond materials such as high-pressure plastic laminates, vinyl, and linoleum to plywood, metal and other firm backings. Press is also suited for laminating 3-ply constructions with honeycomb paper cores, and laminating steel to plywood.

Features: Machine is provided with positive nip adjustment for precise setting of pressure roll gap for panel thickness up to 5". Panels are automatically pulled through press at speeds ranging from 15 to 30 fpm. Vertical alignment of rolls insures excellent bonds regardless of panel thickness.

Description: Rolls are furnished with heat-resistant neoprene covering of specified density which will withstand attack of solvents used in clean-up opera-



Here's CYCLOTHERM'S *3-WAY CUT* in STEAM PROCESSING COSTS!

If you process by steam, use steam by Cyclotherm. You cut costs in these three vital ways:

FUEL COSTS

Cyclotherm Cyclonic Combustion means just what it says—controlled fuel and air, whirling at 200 mph, forming a cyclone in the furnace! This high velocity burning assures maximum efficiency in combustion and heat transfer, resulting in lower fuel consumption.

MANPOWER COSTS

A fire without a fireman! Electronic controls operate the Cyclotherm safely and automatically. Smaller models cycle on and off as steam is required. On larger models, precision modulation coordinates the fuel-air ratio to the load demand, from 30% to 100% of rated capacity.

INSTALLATION AND MAINTENANCE COSTS

Cyclotherm is factory assembled and factory pre-tested. All you do is make five simple connections. 50% maintenance savings are not uncommon. Return tubes cleaned in minutes with no removal or replacement of refractories. No standby unit needed.

And remember—one-third smaller than ordinary generators of similar capacity, a Cyclotherm fits almost anywhere. Many plants have installed two Cyclotherms for utmost flexibility and power. Burns gas or oil with quick changeover. 18 to 500 hp, 15 to 200 psi.

YEARS AHEAD IN STEAM GENERATION

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STEAM AND HOT WATER GENERATORS

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Please send me a free copy of your booklet giving full information on Cyclotherm Steam and Hot Water Generators.

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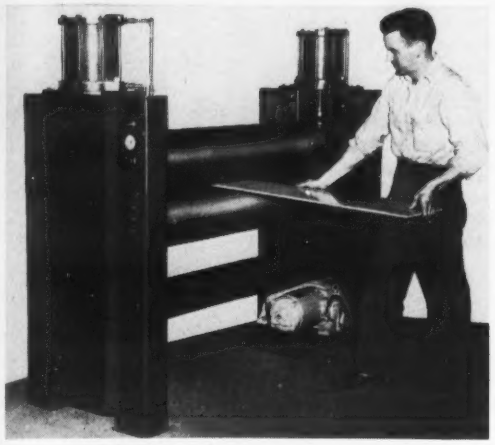
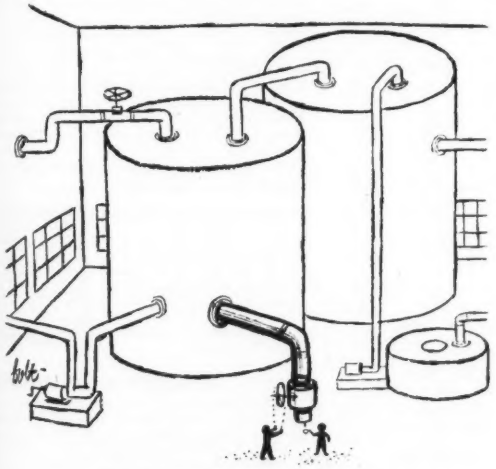
When inquiring check CP 5498 opposite last page



Rolls of press have neoprene covering

tions, as well as the effect of residual heat of panels coming from infra-red re-activating ovens. A 2½"-diam neoprene-covered stabilizing roll mounted immediately behind the nip prevents fluttering of panels as they pass through. Press can be loaded up to 8000 lb with 8"-diam pneumatic cylinders. This can be increased to 10,000 lb by substituting 9"-diam cylinders.

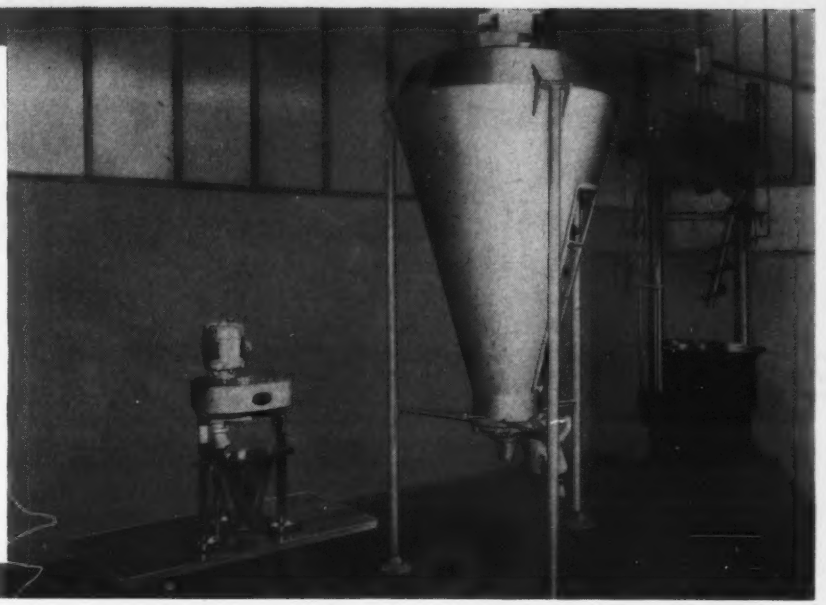
(Wring-Master rotary laminating press is product of Rodney Hunt Machine Co., Dept. CP, 53 Mill St., Orange, Mass. Check CP 5499 opposite last page.)



"Make it a half a cup this time, Joe."

Congratulations to W. K. Witherspoon for this cartoon idea. He's Building Supervisor for E. I. du Pont de Nemours & Co., Inc., in Louisville, Ky.

NOW quick, thorough mixing of dry products



with the NEW Nauta Mixer

Precessional motion of Nauta speeds production... cuts costs

Uniform, *quick* mixing of any number of dry materials in any proportions . . . wetting dry materials with small quantities of liquid . . . or dissolving solids in a liquid media . . . these are the exclusive features of the *new* Nauta Mixer. The gentle, yet positive action of the precessional motion of the Nauta intimately mixes products in any proportion . . . without dusting or change in their original characteristics.

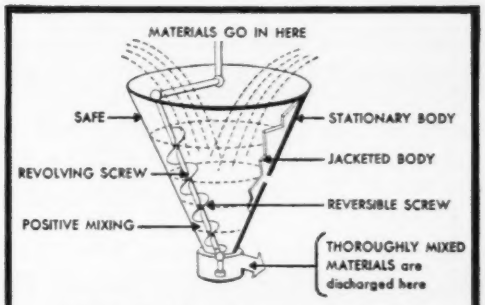
By shortening time cycles required for thorough mixing, the Nauta Mixer increases production. The revolutionary precessional motion means less power consumption. This is a combination that results in substantially lower costs.

Why not try the *new* Nauta Mixer in your operations? We will gladly send complete information on request.

Let us Pretest your product

A quantity of your product ingredients can be mixed under actual production conditions in a Nauta Mixer now in the Buflovak Research Laboratory and Testing Plant, with positive results. Let us tell you about this service.

ASK FOR BULLETIN NO. 374



For profitable use in many industries

The advantages of Nauta Mixers can be enjoyed wherever dry materials require thorough mixing.

Agricultural products	Meat
Ceramic materials	Metal powders
Chemicals	Paint pigments
Cosmetics	Pharmaceuticals
Dissolving viscose rayon	Resins and plastics
Fertilizers	Seeds
Fish meal	Sizing compounds
Flour	Starch
Food products	Sugar
Insecticides	Many other products
Latex mixed with chemicals	

The Buflovak Equipment Division of Blaw-Knox Company is the exclusive licensee for the Nauta Mixer. It is built to the same exacting standards for which Buflovak is famous in building evaporators, dryers, autoclaves, kettles and other equipment.

BLAW-KNOX

BLAW-KNOX COMPANY

Buflovak Equipment Division, 1645 Fillmore Avenue, Buffalo 11, N.Y.

When inquiring check CP 5500 opposite last page

"NETONE" Filter Paper

- HIGH TENSILE STRENGTH
- HIGH BURST FACTOR
- ABRASION RESISTANT
- CREASE RESISTANT
- CHEMICAL RESISTANT

"NETONE" Filter Paper is a neoprene impregnated kraft paper that offers decided mechanical and chemical advantages over standard filter papers.

When compared to 60-pound unbleached kraft "NETONE" Filter Paper shows a 500% increase in wet tensile strength, wet burst factor increases from 6 to 57 and there is a marked increase in abrasion and crease resistance.

The following are a few test results indicating comparative resistance factors.

Solution	60-Pound Kraft	Wet Strength Resin	Neoprene Treated (3%)
H_2O	0	72 hr.	86 hr.
10% HCL	0	6 min.	4 hr.
10% NaOH	0	6 hr.	72 hr.

Write us about your requirements and we will be glad to send samples for your testing.

. . . And for your filter cloth requirements we weave fabrics of VINCEL*, Saran, Nylon, ORLON**, Glass, VINYON N†, TEFLON††, DACRON*** and Polyethylene. Samples sent on request.

* TM—NFM Reg. U.S. Pat. Off.
** TM for Du Pont acrylic fiber
*** TM for Du Pont polyester fiber
† TM—Union Carbide and Chemical Co.
†† TM for Du Pont tetrafluorethylene fiber

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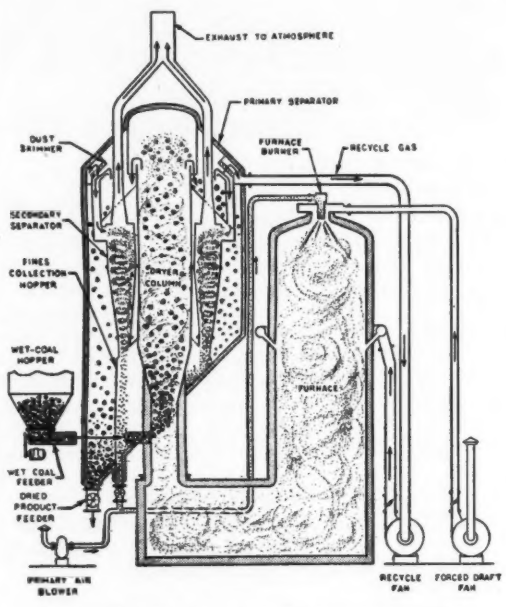
When inquiring check CP 5501 opposite last page

Turbulent entrainment dryer thoroughly dries solids in seconds

Compact system has high capacity and thermal efficiency; low investment, maintenance, and operating costs

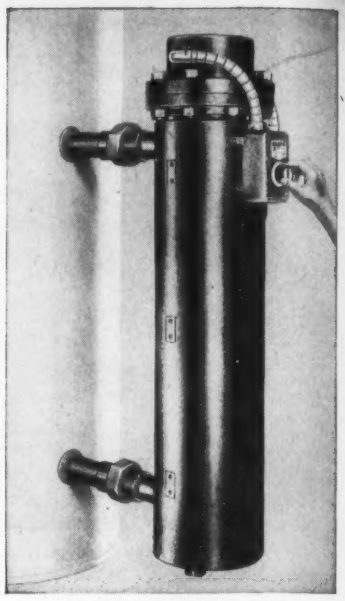
Uses: Although originally developed to handle coal, unit will dry large variety of materials in wide range of sizes. Generally speaking, any material that can be pneumatically entrained can be dried in this equipment.

Features: Surface moisture from material being dried is removed almost instantly. Inherent moisture is removed in matter of seconds. Certain products may be dried for only a few cents per ton. Other advantages include low investment and maintenance costs, high capacity and thermal efficiency, and compact arrangement.



Drawing illustrates operation of dryer as arranged for coal drying

Description: Accompanying drawing illustrates operation of dryer. Screw conveyor introduces product into stream of hot inert gas produced by furnace. Particles are turbulently entrained, releasing their moisture as they are conveyed upward through the dryer column. Primary separator serves as hopper for collecting dried material. Secondary separators remove fines from waste gas before it is exhausted to atmosphere.



CHROMALOX ELECTRIC CIRCULATION HEATERS

Temperatures to 750° rapidly reached . . . accurately controlled

You get these advantages—

Automatic, self-contained heat exchanger that is easy to install, operate and maintain.

- Pre-engineered design with built-in insulation, thermostat and mounting provisions.
- Two pipes connect it . . . two wires energize it. Set it and forget it.

Dependable, round-the-clock operation. Ideal for converting steam or gas heated equipment to automatic electric operation.

Savings that more than pay cost of installation.

For these uses—

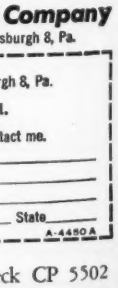
Preheating oil—heating water—generating, superheating and drying steam—heating process kettles and tanks—heating Dowtherm, Aroclor, Prestone and similar heat transfer liquids—heating air, nitrogen and other gases.

Let the Chromalox Sales-Engineering staff solve your heating problems . . . electrically.

Write today for your copy of Bulletin 701

. . . to get complete information on Chromalox electric heat exchangers and applications.

For information on complete line of Chromalox electric heaters, elements, thermostats, contactors and switches —request Catalog 50.



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When inquiring check CP 5502 opposite last page

Products of combustion, cooled in dryer column, are recycled from primary separator to the furnace. Dried product is removed from primary separator by rotary feeder. Dust collected in secondary separators, if combustible, serves as furnace fuel. This can be fed through a rotary feeder into an entrainment tee in the primary air line for transport to burner. When processing other than combustible materials, or carbonaceous materials too expensive to use as furnace fuel, other sources of heat are required.

Entire system is operated at a slight positive pressure. This, coupled with the recycle of inert gas, eliminates possibility of explosion when processing combustible materials. Automatic controls regulate flow of heat to furnace. Controls correct for changes in rate of feed or moisture content of raw material, insuring a uniformly dry product.

Capacity of dryer is described by the gross heat release of the furnace. Most applications fall within 10 million to 70 million Btu per hr range. Each installation is designed to meet requirements of specific application. Flexibility of unit permits operation from 55 to 115% of rated capacity. Manufacturer has pilot plant facilities for testing new materials to establish data for design of large-scale units.

At the present time there are 15 commercial units in operation drying coal. Typical unit, having furnace with gross heat release of 50 million Btu per hr, is capable of drying 95 tons coal per hr from 20% to 5% moisture. Same unit can dry 136 tons per hr from 12% to 2% moisture. Drying costs are as low as 0.107¢ per ton.

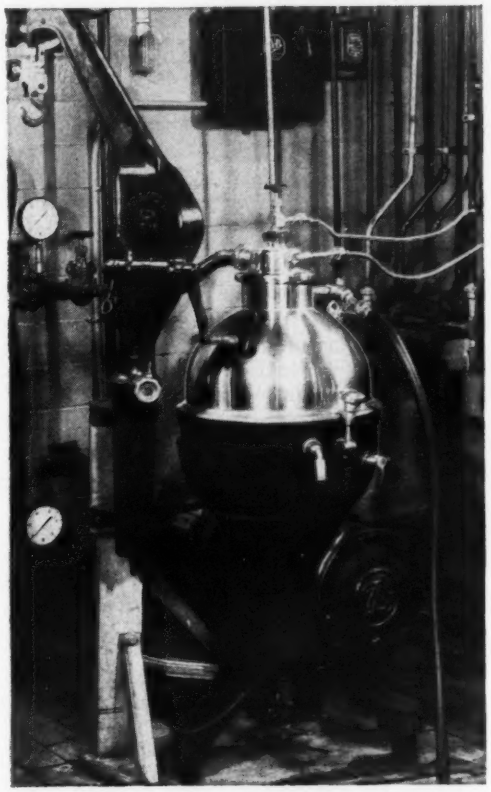
(Parry Dryers are product of Silver Engineering Works, Inc., Dept. CP, 3309 Blake Street, Denver 5, Colorado . . . or for more information check CP 5503 on the convenient Reader Service slip which is located opposite last page.)

Guide for condensing and cooling systems

U-cast hairpin cooling element for vertical immersion is featured in 24-page catalog on cooling and condensing systems. Among subjects covered are design features of the sections used, physical characteristics, and a description of various installations. Fittings used with sections are also described, along with water distribution accessories and hints on installations.

Cat HT-23 is issued by Heat Transfer Division, National-U.S. Radiator Corporation, Dept. CP, 342 Madison Avenue, New York 17, New York. When inquiring about manufacturer's product, reader may simply check CP 5504 on the convenient Reader Service slip which is located opposite last page.

DE LAVAL CUSTOMIZED ENGINEERING . . . HELPS EASTMAN KODAK DEVELOP QUALITY METHODS FOR FILM PROCESSING!



Since the first Kodachrome film was offered to the public, Eastman Kodak has maintained rigid quality controls for the removal of possible microscopic contaminants from its processing solutions.

De Laval development engineers designed the De Laval Hermetic Separator exclusively to meet Kodak's stringent requirements for discriminating performance. In test operations for nearly a year it has made important contributions to processing procedure.

The De Laval Hermetic Separator provides clarifications of solutions for continuous processing of Kodachrome film and facilitates top quality control.

DE LAVAL

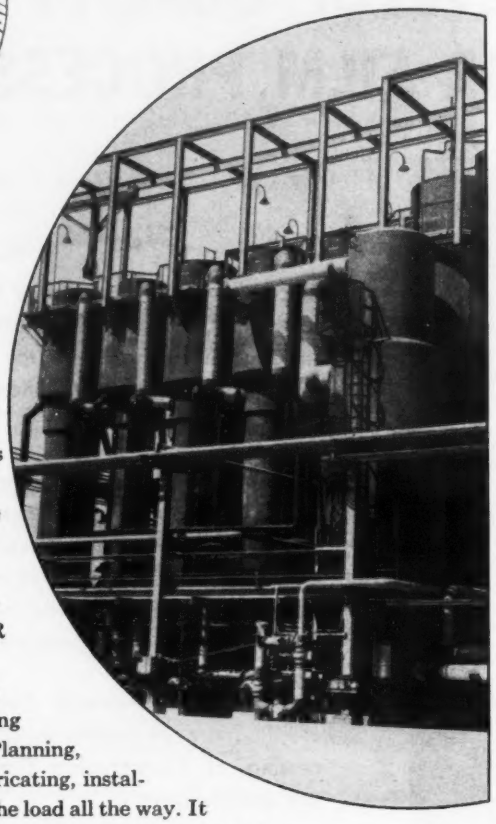
for faster processing systems

THE DE LAVAL SEPARATOR COMPANY Poughkeepsie, New York • 427 Randolph St., Chicago 6 • DE LAVAL PACIFIC CO. 201 E. Millbrae Ave., Millbrae, Calif.

When inquiring check CP 5505 opposite last page

We'll shoulder the entire load . . .

. . . from design . . . to finished product!



Goslin-Birmingham's complete, integrated organization is always at your disposal. Our process engineers are available for prompt, on-the-spot technical consultation and planning. G-B takes YOUR processing problem and comes up with the solution...from planning board to installation. Planning, designing, casting, fabricating, installing...G-B shoulders the load all the way. It will pay to solve your processing problems the G-B way.

Shown here are two self-supporting, sextuple effect alumina liquor evaporators now in use at the Reynolds Metals plant in Corpus Christi, Texas.

G-B Engineers are at your service any time to discuss your processing problems ... without cost or obligation.

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When inquiring check CP 5506 opposite last page

PROCESSING EQUIPMENT

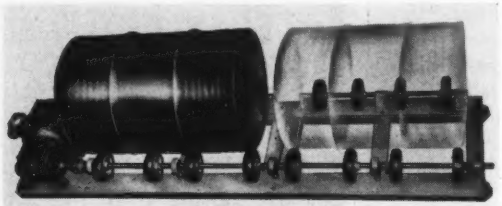
Loads up to 2000 lb handled on double drum rotator . . .

has two complete units operated by single motor

Uses: Agitating, mixing, or tumbling filled drums.

Features: Double drum rotator consists of two complete rotating units operated by heavy-duty gear-head motor. Each unit is capable of handling loads up to 1000 lb.

Description: Machine has all-welded 24 x 94" steel frame, made of 3"-5 lb cross channels and 5"-9 lb horizontal channels. Four lugs are provided to secure unit to floor. Motor (1 hp) is connected to 1" shaft which turns the 8 neoprene drive wheels.



Drum rotator can handle two drums at one time

Motor can be supplied to give any fixed drum speed from 5 to 30 rpm. Eight 6"-diam idler wheels mounted on ¾" shaft assure smooth running. Idler plate can be adjusted in 2" intervals for handling various diameter drums.

(Model 2-5154 double drum rotator is product of The Morse Manufacturing Co., Inc., Dept. CP, East Syracuse, N. Y. Check CP 5507 opp. last page.)

Improved resin polymer products, more efficient reaction periods, with chamber-type reactor . . .

newly-designed unit provides accurate method of controlling rates of polymerization

Uses: Polymerization of plastic monomers.

Features: Unit provides accurate method of controlling rates of polymerization, resulting in more uniform products and more efficient reaction periods.

Description: Reactor consists of a series of hollow, flat-surfaced metal platens between which are set frames of any desired thickness. These platens and frames constitute a number of reaction chambers. Temperature of material that has been fed to chambers is controlled by steam, hot water, or cooling water which is circulated through the hollow plates.

Polymerization is started by first circulating steam or hot water. As soon as reaction temperature is

IMPROVED and EXPANDED Line of Hard Rubber Valves for CHEMICAL APPLICATIONS

NEW FEATURES

DuPont Teflon the universally chemically resistant material is now used for all Luzerne valve packings.

New line of flanged valves has been added to existing Luzerne line of threaded screw stem straight way, screw stem angle and globe valves.

This gives you a complete selection of hard rubber valves. Luzerne valves are available in standard hard rubber compounds or in heat resistant Buna-N synthetic compounds for temperatures to 225° F.

PIPE AND FITTINGS

Luzerne offers a complete line of standard and heat resistant hard rubber pipe and fittings carried in stock in all sizes from ½" to 4". Pipe over 4" size on special order.

Write for complete information or send us your specific hard rubber problem for analysis by our engineering department.

LRC

The LUZERNE RUBBER CO.

Trenton, N. J.

Sales Representatives

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122 East Third Street
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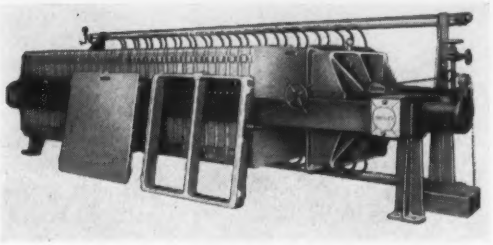
ALBERT J. COX COMPANY
565 West Washington St.
Chicago 6, Ill.

R. C. FOLTZ COMPANY
P. O. Box 13313
Houston 19, Texas

When inquiring check CP 5508 opposite last page



Resin polymerization reactor consists of a series of flat-surfaced metal platens and frames. Unit shown above has 30 chambers, each producing two 24 x 52 x 5"-thick slabs

reached, cold water is circulated through platens to control rate of polymerization until product reaches desired state of viscosity or solid state. Upon completion of reaction, unit is opened and product removed.

Reactor can be made with platens ranging in size from 12 to 56" square, with any desired number of chambers. Frames are the same size as platens and are available in thicknesses from 1 to 5" or greater. Each platen has flexible hose connections to heating and cooling water supply and discharge lines.

(Shriver reactor was developed by T. Shriver & Co., Inc., Dept. CP, 808 Hamilton Street, Harrison, N. J. Check CP 5509 opposite last page.)

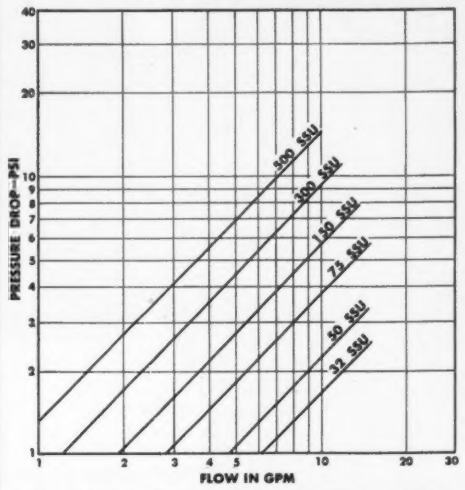
"Whut we needs is one of them thar research departments!"

Our thanks and a $10 check to reader Mark E. Larkin of Bartlesville, Okla., for this cartoon.

DESIGN AND APPLICATION NOTES ON

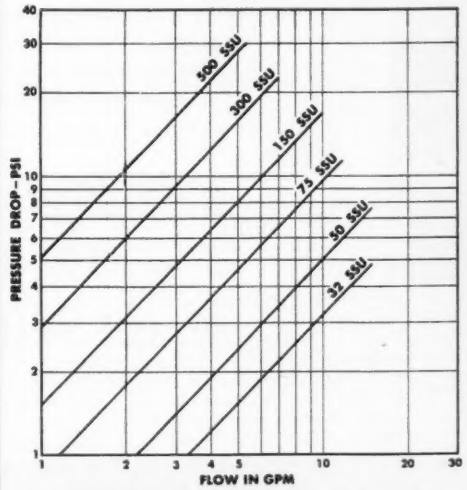
Cuno's new Poro-Klean Filter

TYPICAL PORO-KLEAN FLOW DATA



CYLINDRICAL TYPE

FLOW DATA FOR TYPICAL CYLINDRICAL-TYPE, coarse-grade, PORO-KLEAN filter element, fluid viscosity as parameter. Filtration to 15 microns.



CELL TYPE

FLOW DATA FOR TYPICAL CELL-TYPE, medium-grade, PORO-KLEAN filter element, fluid viscosity as parameter. Filtration to 5 microns.

Precision 3-to-30 micron filter for high temperature and high pressure

PORO-KLEAN, Cuno's new porous stainless steel filter material, now offers the chemical, petrochemical, nuclear, and process industries true micronic filtration for temperatures to 900°F and differential pressures to 2000 psi.

Standard in 316 stainless steel, with low carbon content (0.03 to 0.05% max.), PORO-KLEAN is an ideal filter material for use in applications requiring corrosion resistance, high strength (ultimate tensile strength: 25,000 psi), high resistance to hydraulic shock, or positive freedom from fluid contamination.

Typical PORO-KLEAN applications, already in use in the chemical and process industries, are listed below. Approximate flow-rate curves for typical cell and cylindrical standard elements are shown at left (for exact data, see your Cuno representative).

TYPICAL PORO-KLEAN APPLICATIONS

TO REMOVE:

- Resin and airborne contamination from demineralized water
- Fixed-bed catalyst fines from petroleum products
- Over-cooked gels from polymers
- Radioactive contamination from light and heavy water
- Fine precoat particles downstream from primary filters
- Contamination and/or catalysts from high-temperature and high-pressure refinery gases
- Metal oxides from molten sodium, sodium-potassium, and bismuth
- Iron oxides from fuels
- Rust from steam
- Foreign matter from pharmaceuticals

TO RECOVER:

- Catalysts from gases and liquids

TO DISPERSE:

- Gases into liquids and other gases

If you have problems like these, let Cuno engineers help you apply PORO-KLEAN to their solution. See your Cuno representative, or write Cuno Engineering Corporation, 32-5 South Vine Street, Meriden, Conn. 5.20

CUNO

ENGINEERED FILTRATION

Removes More Sizes of Solids From More Kinds of Fluids

AUTO-KLEAN (edge type) • MICRO-KLEAN (fibre cartridge) • FLO-KLEAN (wire-wound) • PORO-KLEAN (porous stainless steel)

When inquiring check CP 5510 opposite last page

you can pack ship store almost any dry chemical in CHASE MULTIWALL bags and save money doing it!

Soda Ash · Acetamide · Phenol · Alum · Calcium Carbonate · Abietic Acid · Gallic Acid · Methyl Cellulose · Pearl Moss (Irish Moss) · Dimethylurea · Inhibitors · Iron Oxide · Adipic Acid · Talc · Waxes · Vanillin · Resins · Calcium Chloride · Salicylic Acid · Gum Arabic · Umbers · Citric Acid · Black Lead (Graphite) · Nickel Nitrate · Benzoic Acid · Ammonium Chloride · Insecticides · Xanthane · Yeast · Barium Chloride · Fullers Earth · Borax

Chase Multiwall bags give your dry chemicals (effluorescent, deliquescent or anhydrous) *complete* protection—yet, they cost far less than fiber drums, metal containers, or barrels...and they save up to 75% in storage space, too. Available in any combination of plies, with or without liners, tailored to YOUR exact requirements.

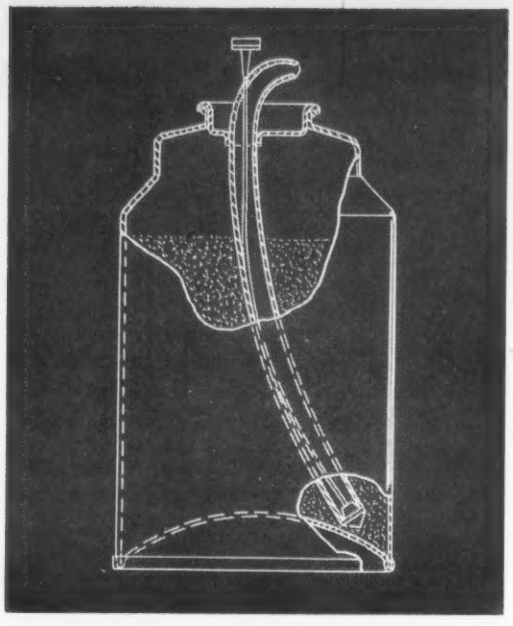
CHECK WITH CHASE—WHATEVER YOUR PACKAGING NEEDS

CHASE BAG COMPANY

General Offices: 309 W. Jackson Blvd., Chicago 6, Ill.

Prompt shipments and personal service from 32 nationwide branch plants and sales offices.

When inquiring check CP 5511 opposite last page

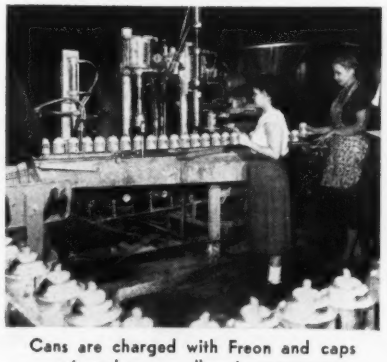


Product packaging always requires considerable attention but packaging for a new product can be a real headache. Safe, Inc., in designing an aerosol fire extinguisher, needed a completely new type valve — necessitating, in turn, a totally new concept in aerosol filling. Result of the search was an . . .

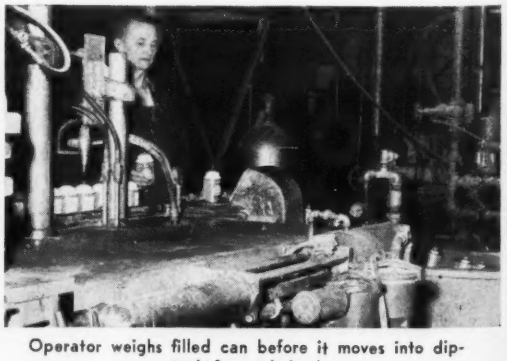
aerosol unit to expel in six seconds

BILL SCHREMP
Assistant Editor

Principal problem in packaging design for aerosol fire extinguisher manufactured by Safe, Inc., Marinette, Wisc., was valve design. While myriad designs are available, none completely met Safe's requirements. Primary needs for the one-shot valve were positive action and large volume. While most valves are designed for expelling liquids in up to 300 seconds, Safe needed to completely empty the unit of dry bicarbonate of soda in from six to seven seconds. Also, valve design had to preclude malfunction — *extinguishers have to work every time.*



Cans are charged with Freon and caps crimped on — all under pressure



Operator weighs filled can before it moves into dip-tank for seal-check

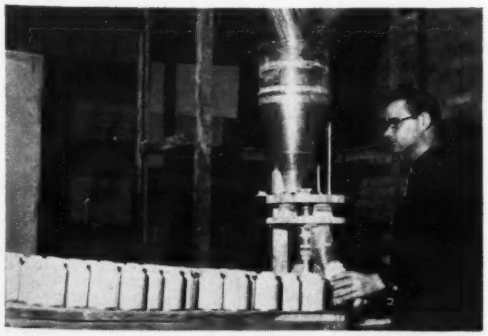
Final valve design differed considerably from that of standard aerosol units. Nozzle and standpipe are single piece of ¼-inch Bundywell tubing. Purpose of rigid standpipe was to assure that pickup end remained at bottom of unit when it was held in normal operating position. Pressure is released when rubber plug at bottom of standpipe is pushed out by operating shaft. Plug is impaled on shaft — positively preventing its interference with material flow.

Valve design, while completely satisfactory in itself, created new problems — neither conventional filling method was practical in this case. Cold-filling might permit moisture to condense within can, interfering with flow of soda. Normal "through-the-valve" filling was out because once unit was sealed and valve opened to accept the propellent, there was no way to reseal. Answer to all of this was a method of "under-the-cap" filling. It works this way: Soda is placed in can and valve is dropped in loosely. Filling head descends on can with rubber O-rings providing seal on can's shoulder. "Fingers" lift cap, propellent (Freon 12) is shot into can, cap is lowered and crimped — all under pressure. From here, can continues on to weigh station.

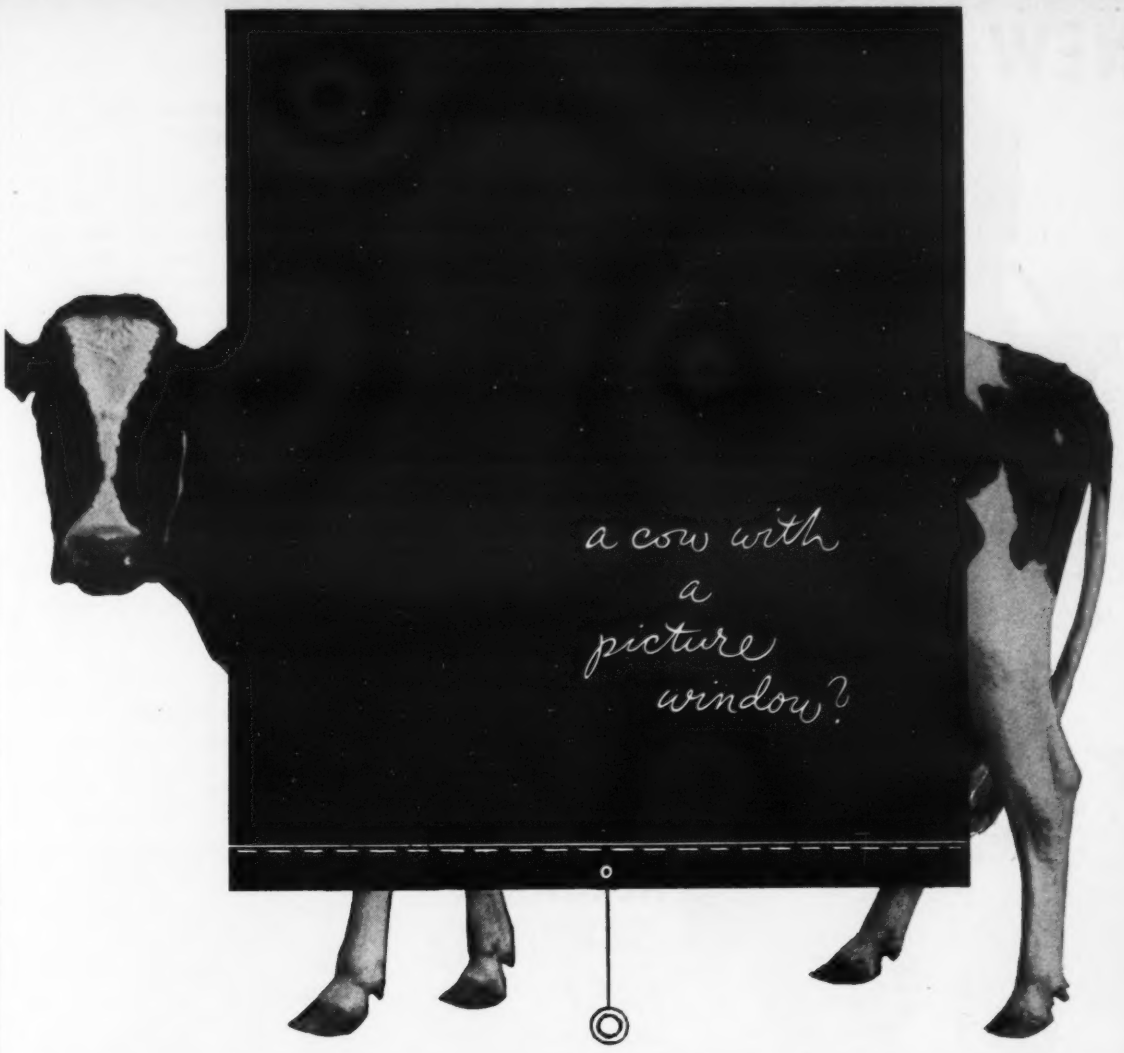
Each can is checked twice for weight: once after soda is deposited and, again, after Freon is added. Units are then carried, via magnetic conveyor, into dip tanks for seal check. Water in dip tanks runs from 130 to 160°F — guaranteeing safety at temperatures well over normal room temperature. After leak testing, can receives protective plastic cap, label, and is boxed for shipment.

(Custom filling for Safe, Inc. fire extinguisher is performed by Gene Rose Co., Dept. CP, 1637 S. Kilbourn Ave., Chicago, Ill. . . . or for more information check CP 5512 on form which is located opposite last page.)

("Under-the-cap" filling head was adapted to pressure filling equipment sold by Alpha Engineering & Machine Works, Inc., Dept. CP, 800 West Central Road, Mt. Prospect, Ill. . . . or for more information check CP 5513 on form opposite last page.)



Cans are filled with bicarbonate of soda from rotary-valve filler



The scientific teams at the Agricultural Research Center of Chas. Pfizer & Co., Inc., will go to practically any length in their search for new "miracle" products to make animals grow faster and stay healthy. They actually installed a "window" in a cow's stomach to study nutritional processes in their search for more effective growth stimulating feed supplements. This is just one example of the never-ending research that has made Pfizer a leading manufacturer of antibiotics.

Maintaining the purity of their products is so vitally important that Pfizer takes the scientific approach in selecting their packaging, too. In searching for a container to ship antibiotic intermediates from their huge Vigo, Indiana, plant to their eastern factories, Pfizer considered and tested many types of containers. Inland *lined* steel containers were finally selected on the basis of (1) their ability to protect costly intermediates perfectly under all shipping conditions, (2) their economy, (3) their rugged strength. "We've depended on Inland drums for several years," says C. W. Smith, Vigo plant superintendent. "And they've never let us down."

NOW . . . ABOUT *YOU*. Maybe your product doesn't demand the extreme care that must be used in packaging wonder drugs. But whatever you make, and no matter how carefully you make it, the follow-through of skillful packaging is too important to be overlooked. For complete information on new developments in steel packaging that may solve your problems, write Bob Boecher, Dept. 313C today.

INLAND

Full line of steel and stainless steel shipping containers, including galvanized and heavy duty ICC drums.

INLAND STEEL CONTAINER COMPANY

Division of Inland Steel Company • 6532 South Menard Avenue Chicago 32, Ill. • Plants: Chicago, Jersey City, New Orleans, Cleveland, Greenville, Ohio.

"Another product safely shipped in Inland 'protection-eered' Containers"

When inquiring check CP 5514 opposite last page

NEW BAGGING SCALE

ACCURATE
WITHIN ONE OR TWO OUNCES

FAST
GRANULAR, STICKY OR FLOODING SUBSTANCES AT 15 TO 20 CHARGES PER MINUTE

VERSATILE
FILL 25 LBS. TO 100 LBS. BAGS ON THE SAME SCALE.

LONG LIFE
NO KNIFE-EDGE PIVOTS. SCALE RETAINS ACCURACY AFTER MILLIONS OF WEIGHINGS.

MODEL 1000N2

The expanding *petro-chemical industry* uses more Thayers than any other scale. Thayer Scales are handling polyethylene, polychloride, carbon black, resins, light and dense soda ash. For engineering recommendations please write THAYER SCALE AND ENGINEERING CORPORATION, ROCKLAND, MASS.

Thayer **AUTOWEIGHTION**
BATCHING · FILLING · CHECKWEIGHING · AUTOMATICALLY

When inquiring check CP 5515 opposite last page

PACKAGING

Describes seamless cans of small capacity

Bulletin of four pages and in three colors describes line of small, seamless metal cans. Capacity ranges from 1/16 to 16 oz. Booklet shows cans for packaging and identifying products; plain seamless slip cover or full open screw top cans for products not requiring identification or requiring a private label; flanged top cans for hermetic sealing.

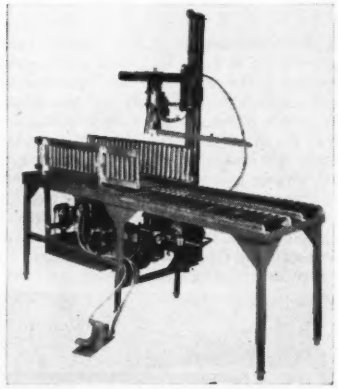
Bul 116 is issued by George D. Ellis & Sons, Inc., Dept. CP, American & Luzerne Streets, Philadelphia 40, Pa. Check CP 5516 opposite last page.

Staples tops, bottoms simultaneously . . .

air-operated, stapler needs no electrical connections

Uses: Unit is designed for simultaneous stapling of tops and bottoms of corrugated and fiber boxes after they are packed.

Features: Stapler is fully air operated . . . is equipped with air



Pneumatic stapler has two heads . . . closes top and bottom of carton simultaneously

filters, lubricators, regulators and gages. Only connection necessary is to supply compressed air at a minimum of 60 psi.

Description: Unit has separate top and bottom stapling heads.

Revolutionary New Design...

***Infra-RED* OVEN SECTIONS**
FOR INDUSTRIAL APPLICATIONS . . .
BAKING • PRODUCT HEATING • DRYING

Sections 4¾₁₆" WIDE:
LENGTH 10½" to 55½"

This new unit permits application of radiant heat in areas heretofore inaccessible with larger units • "SAFETY" Infra-Red Oven Sections can be assembled to meet batch-type baking requirements or mounted in a variety of contoured combinations to accommodate continuous type conveyor line baking operations • Uniformity and control of heat is assured by automatic cycling timers and input controllers. Electric interlocking of ovens provides maximum safety to the product • Write for folder, giving specifications and complete data.

THE SAFETY CAR HEATING AND LIGHTING COMPANY INC
Lighting Division
P.O. BOX 708 MILFORD CONN.

When inquiring check CP 5517 opposite last page

FOR
FAST, SECURE, LOW COST
BAG CLOSING

FISCHBEIN
Portable
BAG CLOSER

- A *truly* portable bag closer . . . Weighs only 10½ pounds.
- Requires no installation . . . plug into any outlet.
- Handles textile and paper bags.
- Simple to operate and maintain.
- Lowest priced bag closer on the market.

FOR DETAILS, MAIL THIS COUPON NOW
DAVE FISCHBEIN CO.
Dept. 9B
2720 30th Ave. So.
Minneapolis 6, Minn.

Name.....
Firm Name.....
Address.....
City.....
State.....

When inquiring check CP 5518 opposite last page

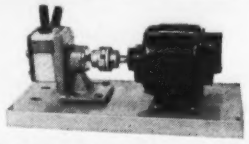
The Problem:

PUMPING ABRASIVE SLURRIES

The Solution:

VANTON PLASTIC PUMP

No stuffing box!
No gasket!
No shaft seals!



A foremost manufacturer of ceramic wall tiles had the problem of transferring extremely abrasive ceramic tile glaze from drums, where the glaze was mixed, to storage tanks. This heavy and extremely abrasive slurry had quickly destroyed mechanical seals and packing in ordinary pumps and rapidly wore rotating parts. A Vanton Pump Model NX-120 (20 GPM) with Buna N body block and Natural Rubber "Flex-i-liner" readily solved this problem reducing maintenance costs to a minimum.

Whether the problem be one of handling abrasive slurries, corrosive solutions, or fluids which must be maintained contamination free, investigate the use of the Vanton "Flex-i-liner" pump. Catalog 55 on request.

VANTON
PUMP & EQUIPMENT CORP.
201 Sweetland Ave. Hillside, N. J.
division of Cooper Alloy Corporation

When inquiring check CP 5519 opposite last page

CUT STENCILING COSTS

eliminate messy, sticky, leaky fountain brushes and ball pots

SPRAY YOUR STENCILS with REYNOLDS quick drying, waterproof STENCIL INKS

- Handy aerosol container is always ready to use. No brushes to clean. No drying out. No waste. Easy to store.

8 COLORS—Red, Yellow, Orange, Blue, Green, Aluminum, White and Black.

Ideal for stenciling boxes, cartons, drums; and all other stenciling applications.

Ask us also about Stencil-Kover—blocks out old stenciling—permits containers to be used again

A TRIAL WILL CONVINCE YOU. Send the coupon for full details Today!

REYNOLDS INK, Inc., 4516 Euclid Ave., Cleveland 3, Ohio
☐ Send literature ☐ Ask your dealer to demonstrate
Name ..... Title .....
Company .....
Address .....

When inquiring check CP 5520 opposite last page

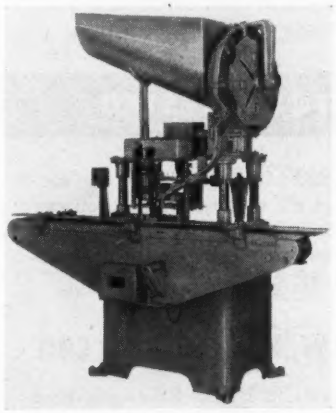
Lower head may be made inoperative by valve adjustment. Stapler accommodates cartons of any length and up to 25" wide and 46" high. Lower head has air-operated whistle reloading indicator. Overall dimensions: length 70", width 37", and height 86".

(Model CSC-2 stapler is manufactured by Container Stapling Corp., Dept. CP, 308 N. Park Ave., Herrin, Ill. . . . or for more information check CP 5521 on form opposite last page.)

Sorts and applies variety of caps

Uses: Equipment sorts, feeds, and automatically applies caps to bottles, jars, or cans.

Features: Unit will cap containers ranging from ½-oz to two gallons.

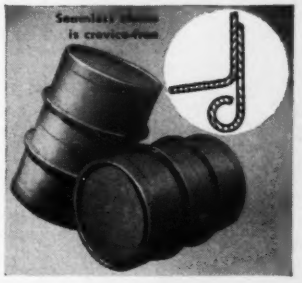


Unit will handle 20 to 60 containers per minute, depending on size

Description: Machine is equipped with ½-hp motor and operates at speeds of 20 to 60 containers per minute, depending on container size. Conveyor is six feet long, weight of entire unit is approximately 1200 lb. Capper is available in four models, Standard, LC, LC-89, and the Special.

(Automatic Screw Capper is manufactured by Resina Automatic Machinery Co., Inc., Dept. CP, 572 Smith St., Brooklyn 31, N. Y. Check CP 5522 opp. last page.)

as easy as washing seamless pans



Seamless chimes of Hackney two-piece acid drums harbor no acid traces between shipments

Here's one reason why so many leading sulphuric acid producers ship in Hackney Acid Drums. Hackney two-piece acid drums are made with entirely *seamless chimes.* They have no interior cracks or crevices where acid traces can linger and carry on intensive corrosion between shipments. Controlled heat treatment further increases corrosion resistance of selected, top-quality steel. Meet ICC specifications for the safe transportation of corrosive liquids such as sulphuric acid, aqua ammonia, titanium tetrachloride, caustic potash and many others.

Rugged and Durable—Take shipping and handling abuses on the chin thanks to such construction features as reinforced chimes, welded-on I-bar rolling hoops, heavy forged spuds. Standard capacities of 15, 20, 30, 55 or 110 gallons. Send today for Drum and Barrel Catalog and minimum quantity data.

Pressed Steel Tank Company
Manufacturer of Hackney Products

1463 South 66th Street, Milwaukee 14, Wisconsin • District Offices:
52 Vanderbilt Avenue, Room 2087, New York 17 • 235 Hanna Bldg., Cleveland 15 • 4247 North Ave., No. 4, Cincinnati 36, Ohio • 57 East Wentworth Court, Minneapolis 19, Minn. • 936 W. Peachtree St., N.W., Room 126, Atlanta 3 • 208 S. LaSalle St., Room 796, Chicago 4 • 568 Roosevelt Bldg., Los Angeles 17 • 4550 Main St., Room 210, Kansas City 6, Mo. • Downingtown Iron Works, Inc., Division, 144 Wallace Ave., Downingtown, Pa.

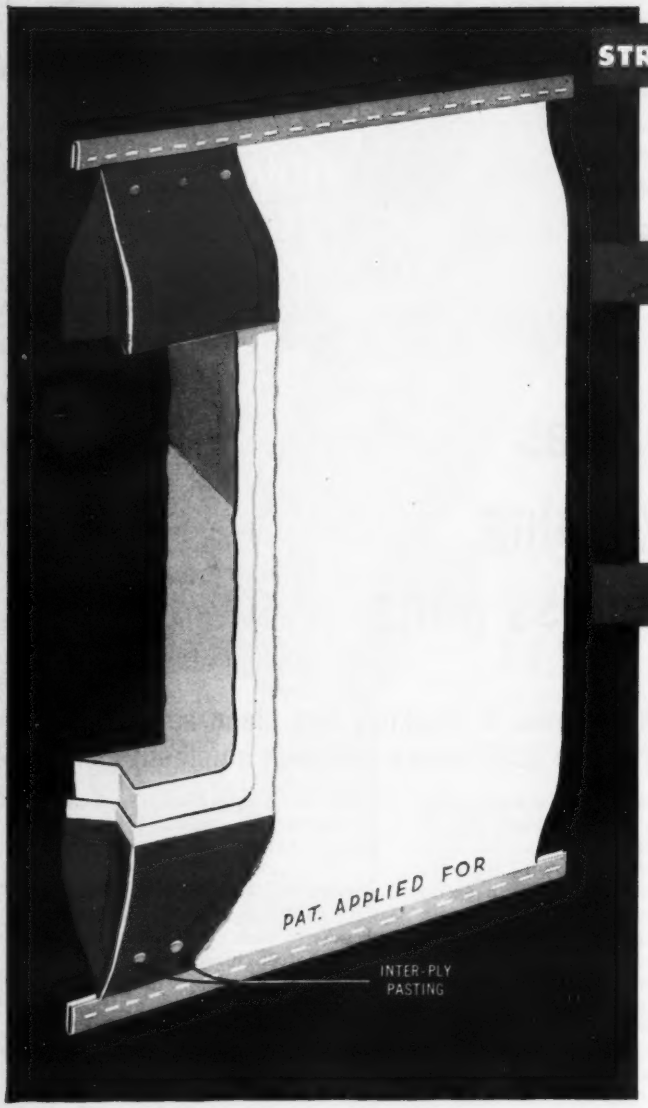
Hackney

CONTAINERS AND PRESSURE VESSELS FOR GASES, LIQUIDS AND SOLIDS

When inquiring check CP 5523 opposite last page

New Strength-end* Bemis Multiwalls

the shipping sack with BALANCED STRENGTH



STRONGER AT THE RIGHT PLACES

New Bemis Strength-End Multiwalls, strengthened top and bottom where most sewn bag breakage is experienced, will cut packing troubles and costs for you.

TWO WAYS TO SAVE

You'll save money one of these two ways with Bemis Strength-End Multiwalls: You may switch from a more expensive type of shipping container. Or, if you are already using multiwalls, you might use bags with fewer plies, because of the greater end strength, where it is needed. Bemis Strength-End Multiwalls may, at lower cost, do your job as well or better.

SUCCESSFULLY TESTED

Bemis Strength-End Multiwalls have been successfully tested in all sections of the country and under all climatic conditions. They have proved themselves for packing cement, fertilizer, chemicals, flour, salt.

Here's how it's reinforced

The reinforcement in Bemis Strength-End Multiwalls is a strip of sturdy kraft, several inches wide, running horizontally around the bag at the ends... anchored to the other walls so it works in conjunction with them... and adding greatly to the strength both at the sewing line and at the gusset corners. It's just plain, common-sense, balanced strength construction.

*TRADE-MARK

Get the complete story about Bemis Strength-End Multiwalls from your Bemis Man.

Bemis BEMIS BRO BAG CO.

General Offices—St. Louis 2, Mo.
Sales Offices in Principal Cities

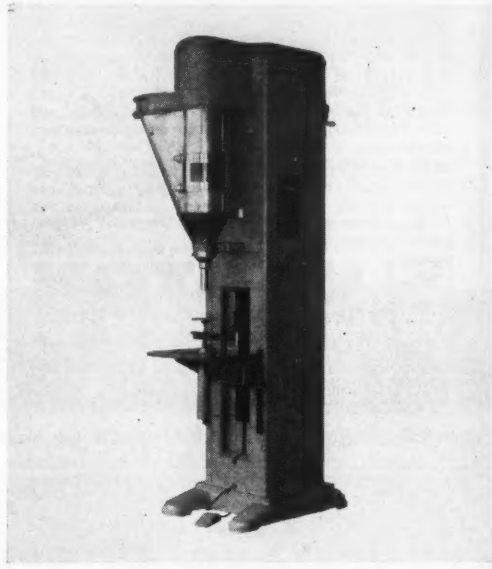
When inquiring check CP 5524 opposite last page

Handles powder, paste products by any of four filling methods . . .

designed for volumetric filling, pressure packaging, gross weighing, or combination auger-vacuum

Versatile filling unit accurately fills cans, jars, boxes, or bags with granules, powders, or pastes.

Filling can be by adjustable cam, packing, gross weight, or combination auger-vacuum depending up-



Filler uses any of four methods to fill cans, jars, boxes, or bags

on density and characteristics of material to be filled. Weight can be anywhere from 2 grams to 10 pounds and speed is usually around 30 packages per minute.

Each of four filling methods can be used by flicking switch on electric control panel at side of machine.

Straight-sided hopper is used to assure free, even flow of material into auger. Another feature is the adjustable table which can be raised or lowered to conform to the height of container. Because of this feature, few auger changes are needed when a variety of products or weights are to be packaged on same machine. Filling nozzle is accessible from front or either side for integration into an existing line.

All working parts are located above filling station which allows an extremely clean operation and easy maintenance. Product spillage on vital operating elements is completely eliminated.

Auger speed is quickly adjustable from 500 to 1000 rpm. Accurate fill of containers is maintained by micrometer adjustment control.

(Model EG Universal auger filler is a product of Stokes & Smith Co., Div. of Food Machinery and Chemical Corp., Dept. CP, 4900 Summerdale Ave., Philadelphia, Pa. Check CP 5525 opp. last page.)

Roller support makes strapping easy

Ball-top table provides nine square feet of working space for boxes, crates

Uses: Strapping table enables operator to stand in one position while rotating heavy containers for packing or strapping. Table eliminates possibility of muscular strains caused by handling heavy containers.

Features: Packages roll over 61 ball casters on table top. Metal strap guide directs end of strap back toward operator.

Description: Table measures 36 x 36″ and is 1½′ high. Constructed of metal clad plywood, table supports 61 one-inch ball casters in staggered

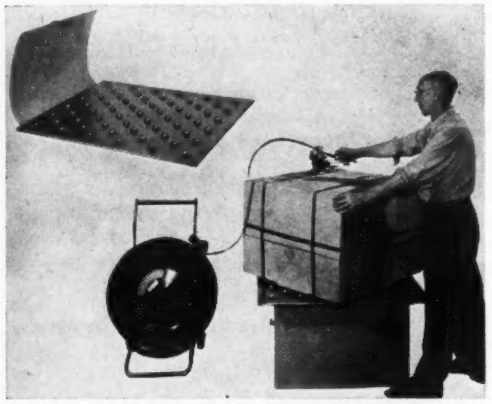


Table top enables operator to remain in one position while rotating heavy containers for strapping

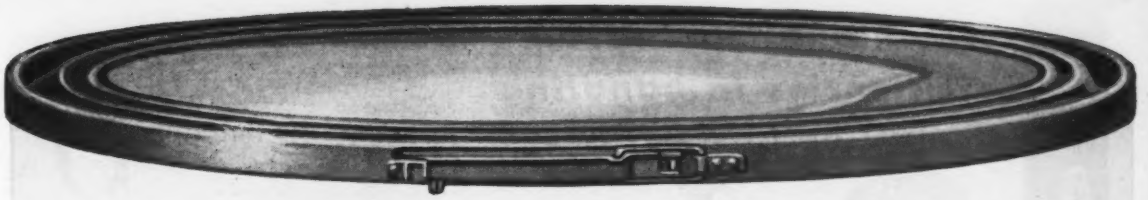
pattern on 3″ centers. Gross weight is 37 lb. Strapping guide is available as optional equipment at no extra cost.

(Strapping table is product of Signode Steel Strapping Co., Dept. CP, 2600 N. Western Ave., Chicago 47, Ill. . . . or for more information check CP 5528 on the convenient Reader Service slip which is located opposite last page.)

Try-it-yourself tape — sample in folder

Two full-color folders picture uses for labeling tape and include a sample of tape for "do-it-yourself" testing.

Forms L-6 and T-1 are issued by Labelon Tape Co., Inc., Dept. CP, 450 Atlantic Ave., Rochester 9, New York. When inquiring specify CP 5529 on form opposite last page.



RHEEM FIBRE DRUMS PAMPER YOUR PRODUCT WITH BETTER PROTECTION

Once you ship your product, it's on its own. Only the drum you have chosen can keep that product safe from the rough treatment it's all too likely to get between you and your customer. That's where Rheem, and Rheem Fibre Drums, come in.

OUTSIDE

Sturdy drum bodies are convolutely laminated from layers of heavy duty kraft linerboard—resilient layers that *give* under heavy blows and spring back for more. And these lightweight bodies are so amazingly strong, they can pick up and carry up to 20 times their own weight, and arrive looking like you *want* them to look.

INSIDE

Rheem Packaging Engineers know few products have exactly the same container needs. They take actual goods on special trips in test drums. Anything that can affect the product goes right along—bounces and blows, moisture, sudden shifts from hot to cold. Out of these trips—and constant field evaluation—come *planned* linings and inner coatings for particular products. It's all part of a never-ending Rheem search for newer and better interior protection.

TOP and BOTTOM

Whether you choose all-fibre or fibre-metal drums, Rheem engineering insures rugged tops and bottoms. All-fibre ends are the same rugged material used in drum bodies—only thicker. Cover closure is quickly and easily made. Economical tape seals eliminate chance of damage when opening or closing for re-use. Metal end constructions have strong lock band closures—maximum convenience for both shippers and users.

You can rely on Rheem for better product protection

For expert packaging counsel, write the Rheem Office nearest you:

477 Madison Ave., New York 22, N.Y. — 4361 Firestone Blvd., South Gate, Calif. — 1025 Lockwood Dr., Houston, Texas — Highway 25, 1701 W. Edgar Rd., Linden, N. J.

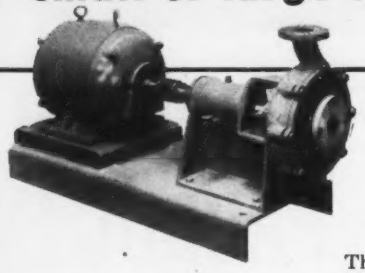
801 Chesley Ave., Richmond, Calif. — 5001 Jefferson Hwy., New Orleans, La. — 7600 Kedzie Ave., Chicago 29, Ill. — Box 6718, Sparrows Point 19, Md.

FIBRE DRUMS, STEEL DRUMS AND PAILS, SPECIAL EQUIPMENT CONTAINERS

When inquiring check CP 5530 opposite last page

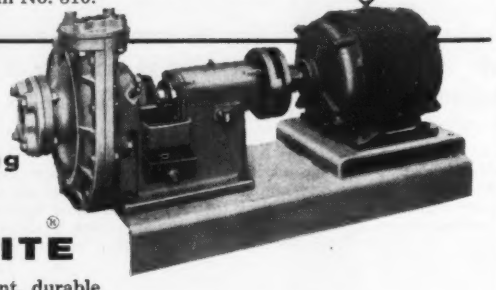
DORR-OLIVER PUMPS

for highest operating efficiencies in handling small or large flows —



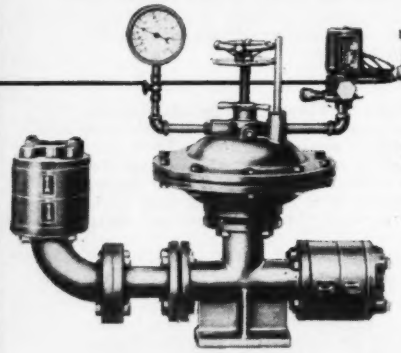
OLIVER
TYPE L
Centrifugal Pump

The Type L is a corrosion resistant chemical pump featuring a high cut-water or tongue of the volute. This makes the pump self venting . . . improves priming. Available in four standard sizes — 1", 1¼", 1½" and 2". Contact parts are made of Alloy 20 or Type 316 stainless steel, bronze or cast iron. 1" model in Alloy 20 stainless steel only. Write for Bulletin No. 310.



Acid Handling Pump
OLIVITE®

An efficient, durable pump for handling hot or cold corrosive solutions. Special rubber or neoprene base composition lines casing, cover and impeller. It does not crack or slough off even under high temperatures. Sizes available — 1¼", 2" and 4". Write for Bulletin No. 308-R2.



OLIVER
Diaphragm Slurry Pump

This pump is designed to operate without mechanical linkage for transmitting force to diaphragm — source of power is compressed air. There is no motor, stuffing box or packing. Capacity quickly changed from zero on up without stopping operations. Pump is ideally suited for handling slurries containing fragile crystals or floc. Six sizes available. Write for Bulletin No. 309-R.

Dorr-Oliver engineers, specialists in pump applications, will gladly discuss your pumping problems. Write for their assistance.

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When inquiring check CP 5531 opposite last page

briefs

from contemporary publications

Power supply to electric furnaces

Paper deals with the problem of serving arc furnace loads. Early planning by the utility and steel plant engineer, proper design, and proper selection of equipment are discussed. Six pages, seven figures. (*"Iron and Steel Engineer," January* 1956, *p.* 67.)

Fungicides

Pesticide chemicals amendment to the Food, Drug, and Cosmetic Act will become fully effective for all fungicides next July. Fungicides will fall into four classes. Pathologists can recommend fungicide uses that appear on labels currently registered with the Department of Agriculture for the coming growing season. Two pages, one photograph. (*"Agricultural Chemicals," February* 1956, *page* 37.)

Kraft pulp mill odors

This review of sources of kraft pulp mill odors and atmospheric sulfur losses is supplemented with descriptions of systems to destroy odors from relief gas. Odors are abated when relief gases are burned. Seven pages, nine tables, four figures, 15 references. (*"Tappi," December* 1955, *p.* 732.)

Coal reserves

Power plant equipment lasts thirty-five years. Will your coal reserves last that long? In the future, how far must your coal be hauled? Will ash fusion temperatures remain constant? Material helpful in answering these questions is given. Three pages, two figures. (*"Power Engineering." December,* 1955, *page* 88.)

Hair sprays

Article discusses use of PVP. Originally used as a plasma extender, PVP is now used in drugs, cosmetics, foods, textile dyeing, paper finishing, and other fields. One estimate is that at least 65 to 75 per cent of all aerosol hair sprays now use PVP. Two pages, one photo. (*"Chemical and Engineering News," January* 30, 1956, *p.* 500.)

Plant layout and design

Trends, present development, and new concepts of plant layout and design are discussed. Two pages. (*"Journal of Industrial Engineering," Jan-Feb* 1956, *page* 29.)

Technical Russian

Paper deals with the Russian alphabet and glossary of common petroleum processing terms in Russian. Five pages, one figure, one photograph. (*"Petroleum Processing," February* 1956, *page* 55.)

Maintenance cost reduction

Techniques to delineate surface and subsurface defects in lead-lined vessels for corrosive service are discussed under several headings. Three pages, eight figures. (*"Mechanical Engineering," March* 1956, *p.* 245.)

Man-made fibers

This survey of dyeing and finishing of man-made fibers embraces Orlon acrylic fiber, Acrilan acrylic fiber, Dacron polyester fiber, Nylon, Acetate, Arnel, rayon, and Vicara. Four pages, 14 references. (*"American Dyestuff Reporter," January* 2, 1956, *page* 8.)

abstracts of pertinent articles in other industrial publications . . . selected by CP editors as a service to you . . .

Centrifugal pumps

Capacities, heads, characteristics, rating curves, specific speed, and other variables are discussed in detail. Four pages, seven figures. (*"Air Conditioning, Heating, and Ventilating," February* 1956, *page* 77.)

Oil separation tendencies

The air-pressure method for determining bleeding tendencies of greases yields reproducible results and is reliable. Apparatus is depicted. Five pages, four tables, eight figures, six references. (*"A.S.T.M Bulletin," December,* 1955, *page* 45.)

Selection of casting resins

Right material for the job is discussed in the use of casting resins to insulate and protect electronic components. Five pages, six photographs. (*"Materials and Methods," February* 1956, *page* 90.)

Cost of dust collection

Grading, collection efficiency, approximate costs of various de-dusting systems, and the relationship between cost of de-dusting and efficiency are discussed. Two pages, three tables, one figure. (*"Foundry Trade Journal," February* 9, 1956, *page* 113.)

Fan platform vibration

Fan assembly or poorly designed platform are two causes of vibration. This paper discusses methods to assure a structurally well-designed fan installation. Two pages. (*"Journal of Heating, Piping, and Air Conditioning," February* 1956, *page* 135.)

Oil masterbatches

A general exponential equation has been found to express the breakdown of the polymer in different oil masterbatches that were heat-aged at 140°F. This equation is valid until the breakdown reaction has been essentially completed. Three pages, three tables, three figures. (*"Industrial and Engineering Chemistry," February* 1956, *p.* 336.)

Ultrasonics in metalworking

For use of ultrasonics in metalworking, the basic principles of operation, types of equipment needed, and power to employ are covered. Attention is given to transducer materials and practical applications. Eight pages, three figures, four photographs, five photomicrographs. (*"American Machinist," January,* 1956, *page* 97.)

TiO_2 in paper

For rapid estimation of titanium dioxide pigment in paper, immerse the dried sample in a wax bath, test sheets for opacity by means of the TAPPI standard procedure T 425 m-44, and use standard curves that are presented. Five pages, one table, 10 figures, three references. (*"Tappi," October,* 1955, *page* 596.)

Corrosion

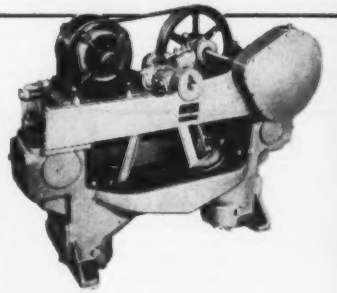
This discussion of electrochemical corrosion in nearly neutral solutions includes modes of oxidation, measurement of corrosion current, "crack-heal," oxygen as inhibitor or corrodent, and pitting in water that contains salts. Thirten pages, one table, 13 figures, 71 references. (*"Journal of the Electrochemical Society," January,* 1956, *page* 73.)

(*Please turn to next page*)

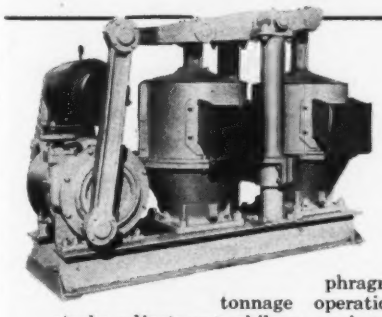
for maximum flow, long life, minimum maintenance

DORR-OLIVER PUMPS

DORRCO Type V Pump



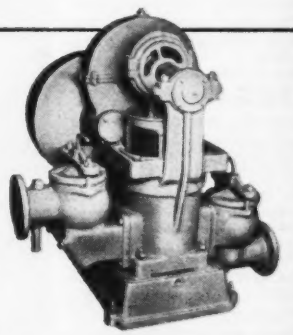
For removing underflows from Thickeners and Hydro-separators by positive displacement. Twin pumping chambers with individual suction and discharge connection for each chamber. Adjustable stroke while pump is running. Six sizes to handle up to 30 cu. ft. of pulp per minute. Write for Bulletin No. 5001.



DORRCO Type W Pump

A rugged duplex diaphragm pump designed for big tonnage operation featuring variable stroke adjustment while pump is running. Available in 6" and 8" models to handle up to 75 cu. ft. of pulp per minute. Write for Bulletin No. 5002.

DORRCO Plunger Pump



A dependable unit for pumping sludges in municipal and industrial water and waste treatment plants. Adjustable eccentric permits stroke variation of 1" to 5". Can be controlled by program time clock for optimum 24-hour operation. Write for Bulletin No. 5182.

Dorr-Oliver engineers, backed by 51 years of pump design and application, will gladly discuss your pumping problems. Write for their assistance.

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Impervite
CORROSION PROOF PROCESSING EQUIPMENT
IMPERVIOUS GRAPHITE

IMPERVITE equipment is unaffected by the action of all corrosives except a few highly oxidizing agents. This material provides excellent thermal conductivity (5 times that of stainless) and is immune to effects of thermal shock. For new equipment or replacements, consider the following facts: Original cost of IMPERVITE equipment is surprisingly low because of a high degree of standardization. Operating efficiency is of the highest level, and impervious graphite normally will provide a longer service life than any other material of construction.

TUBE & SHELL HEAT EXCHANGERS
Standard components are carried in stock for quick delivery of most IMPERVITE Tube and Shell exchangers from 7 to 650 tubes in 9 and 12 foot lengths. All normal tube and shell design features are available as standard. Custom designs are furnished on order.

CUBICAL HEAT EXCHANGERS
. . . provide maximum transfer surface in minimum space . . . and only Falls Industries offers a complete, standardized line of CUBICAL exchangers to meet most requirements. This design accommodates operating pressures in the 150 psi range.

CROSS-BORE* HEAT EXCHANGERS
Featuring a rugged, heavy-duty, one-piece bundle, CROSS-BORE exchangers are furnished in standard, single and multi-pass models for heat transfer areas to 187 square feet. CROSS-BORE exchangers are especially easy to clean, and withstand operating pressures in the 150-200 psi range.

CASCADE COOLERS
IMPERVITE Cascade Coolers feature low-pressure-drop ells and flush nozzles. As standard models they are furnished in 5 tube sizes, and three different models.

CENTRIFUGAL PUMPS*
Outstanding service is afforded by the Falls' designed seal, which is virtually leak-proof. Standard IMPERVITE pump models are furnished up to 200 gpm, 100 ft. head, and specials are available in the range of 1000 gpm.

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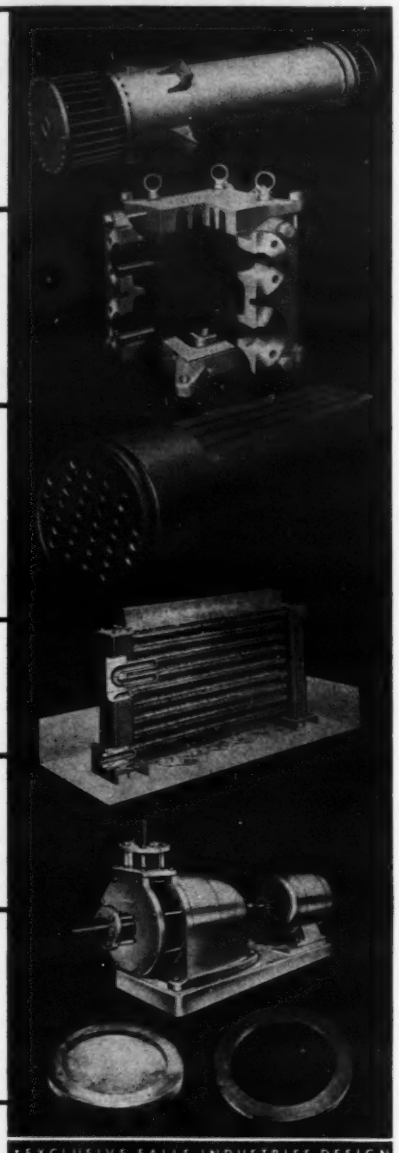
. . . a new idea in frangibles from Falls . . . expendable and economical. IMPERVITE Rupture Disks are standard for 150# flanges, temperature to 300° F., 5% accuracy, diameters from 2" to 12". Specials are furnished to 30" diameter, to 250 psi burst, to 700° F. temperature.



ALL IMPERVITE EQUIPMENT IS PRODUCED COMPLETELY WITHIN THE FALLS INDUSTRIES ORGANIZATION UNDER THE CLOSE CONTROL OF CHEMICAL ENGINEERS.

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briefs

from contemporary publications

(*Continued from preceding page*)

Vicara

The following facets of Vicara are covered in a series of four papers: manufacture and properties, use in woven fabrics, processing and dyeing, and advertising and promotion. Seven pages, eight tables, four photographs, seven references. (*"Modern Textiles," January,* 1956, *page* 57.)

Mass transfer properties

Relative resistances of 24 metals and alloys to mass transfer in liquid lead were measured. Nickel and nickel-rich alloys proved highly susceptible to mass transfer. Four pages, seven figures, one reference. (*"Corrosion," February* 1956, *page* 87*t*.)

Sulfite waste liquor

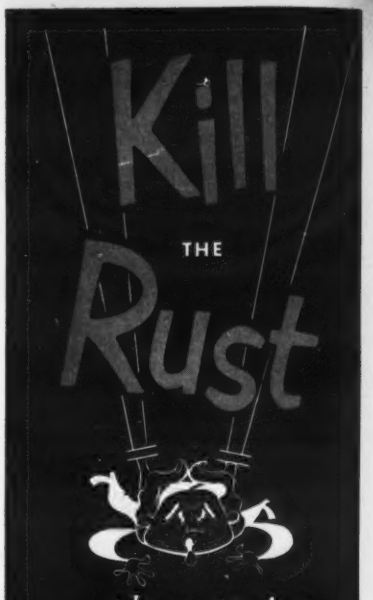
Addition of sulfite waste liquor to portland cement before buring reduced fuel consumption, improved quality, increased milling capacity, and increased production. Five pages, six tables, six figures, seven references. (*"Paper Trade Journal," January* 16, 1956, *page* 20.)

Textured yarn

"Taslan" textured yarn, which consists of randomly spaced loops, is discussed under headings of functional characteristics, versatility, aesthetic and physical properties, and difference from stretch yarn. Four pages, eight figures. (*"Mechanical Engineering," January,* 1956, *page* 7.)

New chemical industries for Houston, Texas

Aid given by Houston (Texas) Chamber of Commerce to several chemical and allied industries seeking new locations is recounted. Two pages, one table, three photographs. (*"Chemical and Engineering News," January* 30, 1956, *page* 444.)



OSPHO
CONQUEROR OF RUST

saves hours of preparation time, doubles paint job life

OSPHO *stops* rust action on any rusted surface. It's the perfect metal treatment for use *under* your regular maintenance paint. Save hours of preparation time—no sandblasting, no scraping, no flame-cleaning. Brush or spray OSPHO on; rust turns to hard gray iron phosphate. Your paint jobs last twice as long. So easy to use you don't even have to stir it. OSPHO is a *proven* product used and reused by hundreds of companies and institutions for all kinds of maintenance painting. Gallon covers a minimum of 500 square feet yet cost is only $3.00 per gal. (in cases of 4), $2.80 per gal. (in 10-gal. kegs), $2.60 per gal. (in 50-gal. barrels). (F.O.B. Cleveland.) Order now—see with your own eyes how OSPHO *kills* rust.

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Quality Maintenance Products Since 1917

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briefs

from contemporary publications

Protective coatings

Rust-preventive oils, water-displacement oils, semirigid soft coatings, and hard, tough coatings are discussed relative to the protection of industrial, agricultural, and military equipment. Five pages, two tables, one figure, one reference. (*"Lubrication Engineering," Jan-Feb* 1956, *page* 19.)

Analysis for oxygen

Oxygen analysis for combustion control is facilitated by new high-speed sampling means and rapid instrument response. Equipment for analysis of flue gas for oxygen is discussed. Eight pages, 11 figures, nine photos. (*"Power," Jan.,* 1956, *page* 90.)

Industrial minerals

Technical trends in rock products industries during 1955 are surveyed under headings of beneficiation, fine grinding and crushing, automatic sampling, lightweight aggregates, industrial sand, drills and shovels, gypsum and ready-mixed concrete. Seven pages, one figure, eight photographs. (*"Rock Products," January,* 1956, *page* 80.)

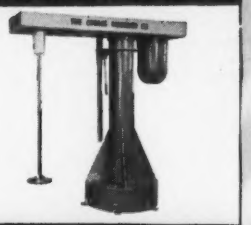
Water treatment

Effects of activated carbon, aluminum sulfate, ferrous sulfate, chlorine dioxide, bentonite, and primary rosin amine acetate on synthetic detergents in water are presented. Thirteen pages, 11 tables, four figures, seven references. (*"Journal American Water Works Association," January,* 1956, *p.* 30.)

Plant maintenance

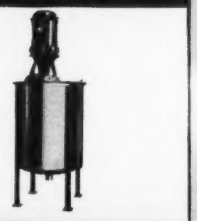
Applications of statistics to plant maintenance are illustrated. Covered are: the chi-square test, frequency distributions, sampling, data that require no analysis, and correlation. Six pages, five tables, seven figures. (*"Industrial Quality Control," January,* 1956, *page* 12.)

MANY MODELS TO CHOOSE FROM
—special engineering adaptations if necessary

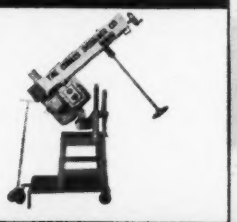


10 and 20V with hydraulic lift. For big-volume production. 80" high, 10-30 HP.

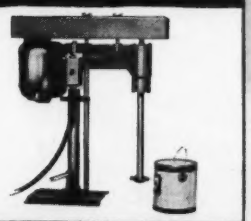
10 and 20D, for installation on your own tanks. For adaptation up to 40 HP.



20D—Tank Type. Standard models for capacities of 100, 250 and 500 gallons. Special engineering for specific needs.



7-VTV—Mobile Tip-Up Type. For 5 to 80 gallon batches. Width 41½". Max. tilt will accommodate 46" tank.



1-VT Laboratory Lift-Up Type. For testing, pilot plants and small batches. Results identical to production-size models. Max. rise, 44".

NEW improved models of COWLES DISSOLVERS

give you ultimate dispersion 2 to 20 times faster than ordinary machines—in a fraction of the space—at a fraction of the cost

For processors of liquid-liquid, gas-liquid and solid-liquid products, including . . .
CHEMICALS
PAINTS & INKS
PLASTICS • DRUGS & PHARMACEUTICALS
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Let us prove it in your plant...at our risk!

Here are typical examples from the complete new line of Cowles Dissolvers. They feature many improvements that make them better than ever before. If you are using bulky, slow, conventional equipment, the proper Cowles equipment for your needs will give you increased speed, greater volume and higher quality end products—plus savings in cost—that will amaze you.

We are so sure of its many advantages we want to demonstrate them to you—with the actual equipment, in your own plant, on your own products—without obligation to purchase.

Applicable to viscosities up to and in excess of 50,000 centipoises, they impart high velocity to material at a speed of 3600 to 6000 f.p.m. at the periphery of the impeller. Zones of intense turbulence are created, producing extreme shear and impact. After turbulence, flow becomes laminar, dividing at vessel wall to assure complete circulation of the entire batch. This action breaks down solids to ultimate dry particle size, exposes greatest possible area of reactants to each other, and surrounds each particle with a film of liquid.

The new models require less head room, include patented impellers for processing a wide variety of products, and many other refinements for ease of operation and maintenance. If milling is required following mixing, teaming up Cowles Dissolvers with Morehouse Mills will produce products of finest quality at rates that are nothing less than spectacular.

A trial will convince you that this equipment will give you greater production, of higher quality, at less cost—all over results that mean you can—

Make More Profits with Morehouse-Cowles

You can make such a trial in your plant at our risk. Write today for complete details—

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Quality Production Champions of the Processing Industries.
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MOREHOUSE COWLES

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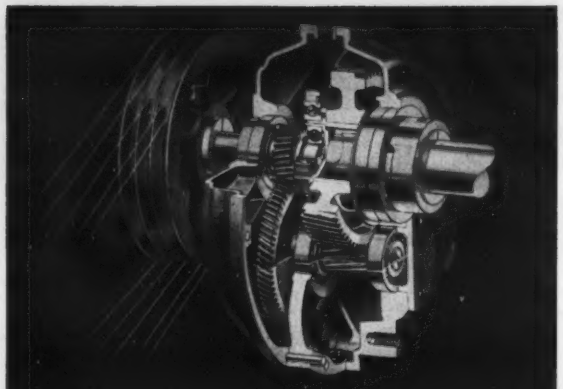

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AMERICAN SHAFT-KING
is the pace setter
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POWER AT THE SPEED YOU NEED

Write today for complete catalog including selection tables.

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When inquiring check CP 5536 opposite last page

Since Peter Hand Brewery switched to impulse steam traps, they have —

more heat in process, less in condensate

Warm-up time to bring 9000 gal kettle to boil has been cut by about one-third

Frank E. McElroy, Assistant Editor
With **Ernie Jaeschke,** Chief Engineer
Peter Hand Brewery Co., Chicago, Ill.

Problem: In boiling wort and hops — one step in making Meister Bräu and Peter Hand Reserve beers — it took one hour to warm up the 9000 gal copper percolating kettles prior to boiling the mixture. Wort enters the kettles from the lauter tubs at 165°F, and must be brought up fast to 212°F for the boiling step.

Solution: The bucket-type traps were replaced with High Capacity Impulse traps in March of 1954. A 1½" No. 56 trap is now used to take condensate from a 6" copper tube coil in bottom of wort tank. This coil operates on 125 psig steam. A 2" No. 57 impulse trap was installed to drain the percolator line, which operates on 40 psig steam.

These small traps are designed to handle 60,000 to 70,000 lb of condensate per hour. This includes a safety factor for additional warm up load. Traps are made principally of a stainless steel to resist

CP Staff Photo

Chief Engineer Jaeschke checks impulse steam trap in 1½" line from coil in wort tank

CP Staff Photo

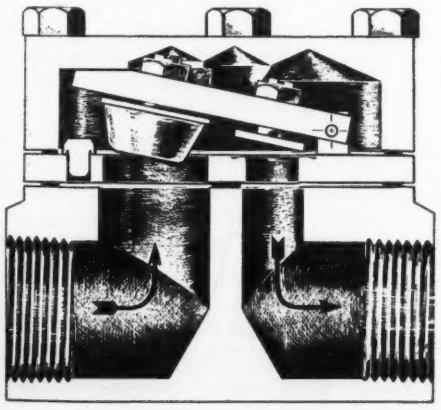
Impulse trap on ½" line from pasteurizer has increased temperature of heating coils by 30°F

effect of the low pH condensate. A strainer is placed in line to protect trap from fine particles.

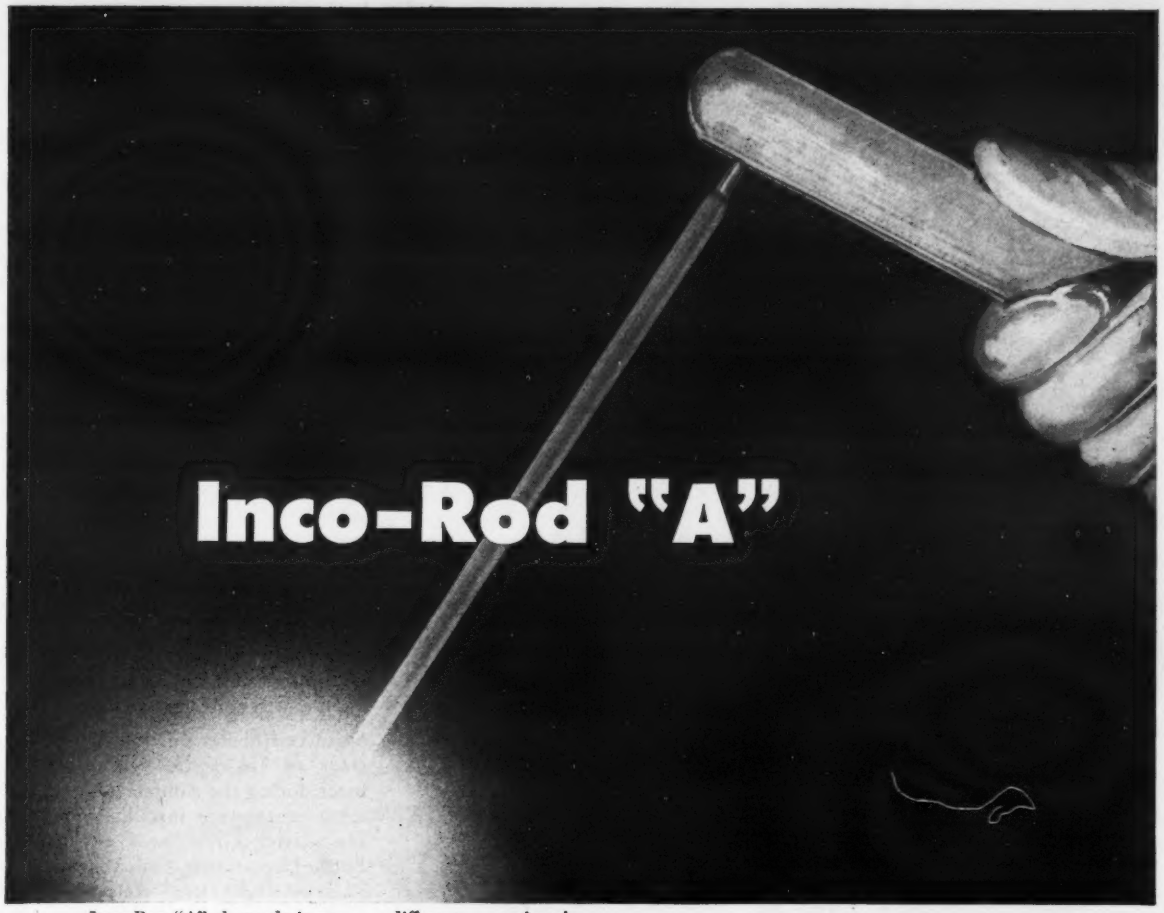
Simple in operation, impulse traps have a hinged lever on which two valves are mounted. When steam is turned on, pressure of air and accumulated condensate lifts the larger inlet valve (on left side of diagram). Simultaneously, the smaller valve (in series with it, at right) is raised. Air and condensate flow out through discharge orifice, passing from high pressure inlet area to the low pressure discharge side of the trap.

By having these valves in series, an intermediate pressure is produced in the control chamber above valve plate. Temperature changes of condensate cause pressure variations which, in turn, control valves. Therefore, from starting temperature to just below the steam temperature, intermediate pressures remain sufficiently low to keep valve wide open and permit full capacity discharge. As

(*Please turn to next page*)



Cutaway view of impulse trap shows how it works



INCO-ROD "A" electrode is new . . . different . . . unique!

. . . welds most dissimilar-alloy joints

This versatile, new electrode successfully welds mild steel to 330 . . . 405 to Inconel* nickel-chromium alloy . . . 304 to 410.

More than thirty such combinations have been made between and among ferritic and austenitic stainless steels, low-alloy steels, mild steels, high-nickel alloys, and other types of alloys.

In fact, we expect Inco-Rod "A"* electrode will prove satisfactory for more than 90% of such joints between dissimilar alloys.

This new easy-handling electrode with the distinctive *green* flux coating gives you strong, ductile, X-ray-quality welds. Gives you excellent operability in any position . . . spray-type arc . . . good slag removal! In addition, the impact properties at sub-zero temperatures, stress-rupture properties at elevated temperatures and corrosion resistance will be of a high order.

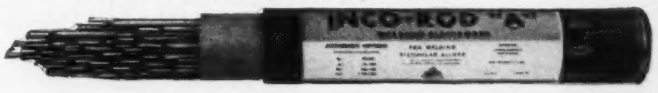
For welding data on many *proven* combinations of dissimilar alloys, write for the new Inco folder, 'Announcing INCO-ROD "A" '. Be sure to ask, too, about alloys you need to join. New information, constantly coming in from the field, may provide a practical answer to your welding problem.

The INTERNATIONAL NICKEL COMPANY, Inc.
67 Wall Street New York 5, N. Y.

*Trademark of The International Nickel Company, Inc.

Four handy sizes. INCO-ROD "A" is produced in 14-inch lengths, 4 diameters: 3/32-, 1/8-, 5/32-, 3/16-inch. Packed in 5-lb., tubular, asphalt-lined, protective containers (NEMA color coded).

INCO TRADE MARK **WELDING PRODUCTS**
electrodes • wires • fluxes



When inquiring check CP 5537 opposite last page

...t the "K" means to you...

assurance of
CRITICAL INSPECTION

Quality controlled inspection of "K" fittings begins with constant control of the melt. Inspections take place at every stage of the process. Sharp-eyed, experienced men are ever checking and testing with the high standards that have to be maintained.

"K" fittings, therefore, substantially exceed code requirements and "K" fittings are, of course, Underwriters' Laboratory approved.

Be sure the fittings you use will do their job. Use only closely inspected fittings. You can know them by the "K".

K

THE KUHNS BROTHERS CO.
1800 McCALL ST. • DAYTON 1, OHIO
Established 1887

When inquiring check CP 5538 opposite last page

Impulse Steam Traps

(*Continued from preceding page*)

condensate temperature approaches boiling, some of the very hot liquid flashes at the reduced pressure in control chamber. Increased pressure, plus volume of condensate pushes on upper side of valves. When this is combined with unbalanced downward force on the discharge valve due to low pressure at trap outlet, there is sufficient pressure to close valves, shutting off condensate flow.

Trap is designed to insure, by means of the small control flow, a continuous sampling of the condensate so that the moment condensate is cool enough to reduce flashing in control chamber, trap reopens for full discharge. Then the process repeats itself.

Results: Time to bring kettle to boil has been reduced from 75 minutes to 50-55 minutes. However, the warm-up cycle has now been changed so that the kettle is filled about half way before steam is turned on. Total time to fill the kettle and heat it is about two hours. This entirely prevents "scorching" of the wort.

So successful has this installation been, that when traps on the bottle pasteurizer needed replacement during the summer of 1955, No. 60 Impulse steam traps were installed. These were ½" IPS. Mr. Carter Gran, head of maintenance in the Bottle Department, finds they've increased temperature on the heating coils by 30°F, thus shortening warm-up time (see photo page 185).

(High Capacity Impulse and Impulse steam traps are products of Yarnall-Waring Company, Dept. CP, Chestnut Hill, Philadelphia 18, Pa. . . . or for more information check CP 5539 on form opposite last page.)

Reduces explosion hazard in spraying highly volatile fluids . . .

spray gun has spark-resistant construction

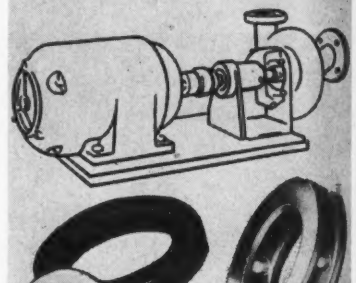
Uses: Spraying highly-volatile fluids in confined areas.

Features: Spray gun resists development of a dangerous spark when accidentally dropped or struck against hard objects, thereby reducing explosion hazards.

Description: Unit will handle protective plastic material which is volatile. Materials of construction have been selected for their non-sparking properties.

(Model 18 S.R. spray gun is a product of Binks Manufacturing Co., Dept. CP, 3114 Carroll Ave., Chicago 12, Ill. . . . or for more information check CP 5540 on form opposite last page.)

Keep "Down-Time" to a Minimum



CHEMPRO TEFLON PACKINGS

CHEMPRO TEFLON SEAL CAGES

If you are pumping or processing highly corrosive liquids and slurries, the Chempro Teflon† Packing-Seal Cage combination can drastically cut packing and shaft replacement, and keep your "down time" to a minimum. Pumping operations that formerly required daily repacking now operate continuously for months without repacking.

CHEMPRO TEFLON RING PACKING provides a frictionless, positive seal impervious to chemical attack. Chempro Styles 101 and 201 packing are available in ring sets, solid or split, to fit any pump or process equipment stuffing box.

CHEMPRO TEFLON SEAL CAGES for lubricating or cooling stuffing box packing are machined in a single flexible piece that snaps over the shaft, fitting snugly without vibration. They are non-scoring and corrosion-resistant, and last many times longer than metal lantern rings.

Ordering Information

1. Specify equipment make, model and size
2. Diameter of shaft
3. Bore and depth of stuffing box
4. Number of rings, solid or split
5. Material to be handled

THE ORIGINAL FABRICATORS OF TEFLON PACKINGS AND GASKETS

† duPont Trademark

CHEMICAL & POWER PRODUCTS, Inc.

9 Broadway, New York 4, N.Y.

When inquiring check CP 5541 opposite last page

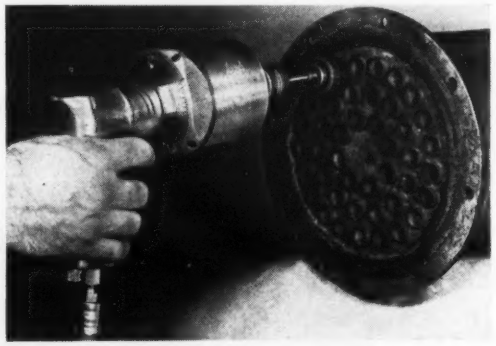
All-air-driven tube expander drive has torque output calibrated in foot-pounds . . .

measuring torque at ouput spindle prevents over or under-rolling of tubes

Uses: Tube expanding applications in fabricating heat exchange equipment.

Features: Tube expander drive is all-air driven. Torque output is measured at output spindle for maximum convenience and efficiency. Output calibrated in terms of foot-pounds prevents overstressing of tube sheets, reduces warpage, and keeps tubes from being over-rolled or under-rolled.

Description: Unit produces 14-pound torque at 90 psi with maximum consumption of 12 cfm of air. Only connection required is operating air hose. Basic unit is of pistol-grip design furnished with an auxiliary handle that may be swiveled to



Operating variables do not affect torque measurements on tube expander drive

any position desired. Oil reservoir is built into handle. Total weight with auxiliary handle is approximately 7½ lb and length is 10". Operating variables such as motor wear, changes in quantity and viscosity of lubricants, and voltage fluctuations do not affect torque output measurements

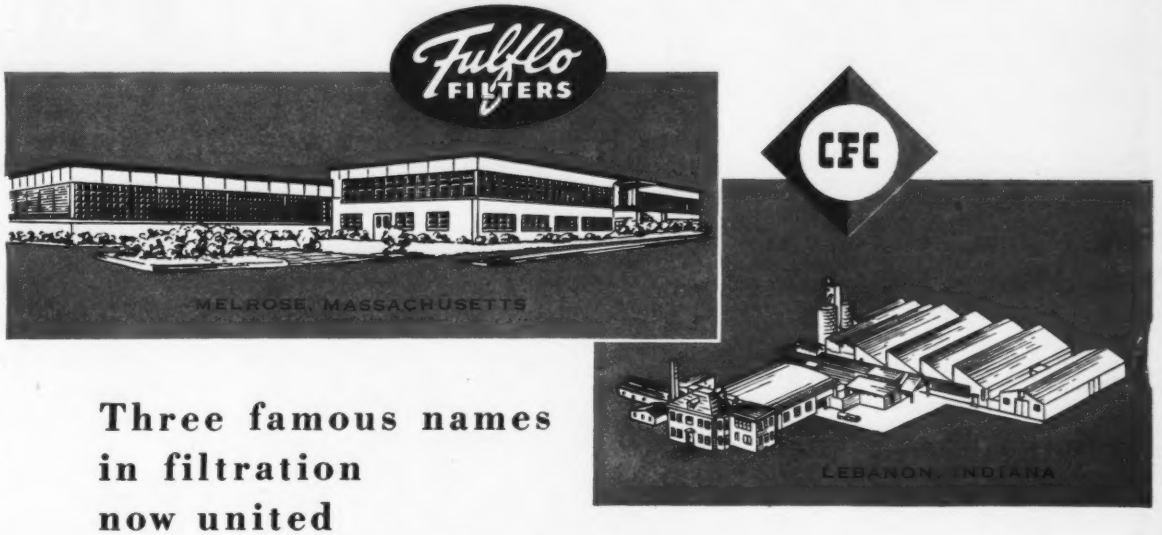
(Torq-Air-Matic is a product of Thomas C. Wilson, Inc., Dept. CP, 21-11 44th Ave., Long Island City, N.Y. . . . or for more information check CP 5542 on form opposite last page.)

Pump's materials of construction, capacities presented

Materials of construction, capacities, and impeller materials of general-purpose, positive-displacement pump are presented in data sheet. Suggested applications are included.

DS 955 is available from Eco Engineering Co., Dept. CP, 12 New York Ave., Newark 1, N.J. Specify CP 5543 opposite last page.

Commercial Filters Corporation acquires Honan-Crane and Michiana



Three famous names in filtration now united for greater service to industry...

A FILTER FOR EVERY PURPOSE
Honan-Crane Oil Filters featuring a wide selection of interchangeable cartridges plus several types of bulk refill materials to provide "selective filtration" . . exactly suited to your requirements.
Fulflo Filters in all sizes for ultra-high flow rates with lowest pressure drop Low-cost, long-lasting Honeycomb Filter Tubes give true depth filtration in a wide range of precision-controlled densities for any desired degree of micronic filtration
Michiana Lube and Fuel Oil Filters for diesel and gas engine service. Available in a wide selection of types and sizes.

1. **Commercial FULFLO Filters and Honeycomb Filter Tubes** . . . the original controlled density element for full flow liquid filtration.
2. **HONAN-CRANE Filters** with bulk or cartridge filter elements, and **CFC** Pre-Coat Filters, Magnetic Separators, Coolant Clarifiers and Tubular Conveyors.
3. **MICHIANA Lube and Fuel Oil Filters** for diesel and gas engines.

The addition of Honan-Crane and Michiana enables Commercial to offer you the nation's most extensive line of filters for industrial use. Fulflo Filters and Honeycomb Filter Tubes will be manufactured exclusively at Commercial's modern plant in Melrose, Massachusetts. A newly-formed Lebanon, Indiana subsidiary—Indiana Commercial Filters Corporation—will be devoted to the production of Honan-Crane, Michiana and CFC equipment.

The expanded Commercial Filters organization represents a combined total of 70 years' experience in the industrial filtration field. This wealth of experience is available on any phase of your filtration program.

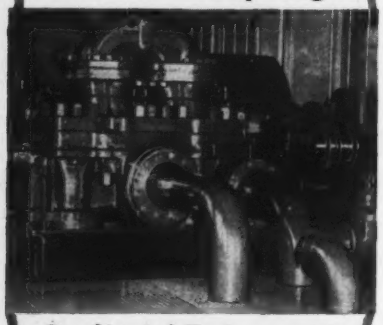
DISTRICT OFFICES—
New York • Chicago • Memphis
Sales and Service Representatives in more than 30 principal cities

COMMERCIAL FILTERS CORPORATION

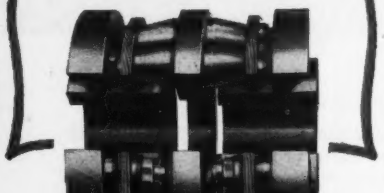
plants at:
Melrose, Massachusetts and Lebanon, Indiana

When inquiring check CP 5544 opposite last page

PROTECT YOUR PUMPS with THOMAS Flexible Couplings



One Chemical Engineer reports he formerly spent 95% of his time supervising repacking of pump glands. Then he installed Thomas Flexible Couplings. Now his pumps need no attention.



Only THOMAS Flexible Couplings offer:

UNDER LOAD and MISALIGNMENT

1. No Cross-pull on Bearings or Gland.
2. No End-thrust on Bearings or Impeller.
3. Freedom from Backlash—Torsional Rigidity
4. Free End Float
5. Smooth Continuous Drive with Constant Rotational Velocity
6. Visual Inspection in Operation
7. Original Balance for Life—*and*

THOMAS ALL-METAL COUPLINGS HAVE NO WEARING PARTS SO THEY REQUIRE NO LUBRICATION AND NO MAINTENANCE

Write for Catalog 51A

THOMAS FLEXIBLE COUPLING CO.

WARREN, PENNSYLVANIA, U.S.A.

When inquiring check CP 5545 opposite last page

High head with high volume possible in double-ended, canned pump . . .

pumping chambers can be piped in series or parallel

Uses: Leakproof handling of corrosive, toxic, explosive, radioactive, or other hard-to-handle liquids.

Features: Canned motor pump is basically two pumps. These can be piped in series or parallel for leakless high-head or high-volume operations.

Description: Unit gives heads to 230 feet. It is available in cast iron, cast steel, 300-series stainless steel, Monel, and Carpenter-20. Standard temperature and pressure limits are 450°F and 300 psi.

Double-ended pump gives heads to 230 feet

(Series DE Chempump is product of Station J, Chempump Corporation, Dept. CP, 1300 E. Mermaid Lane, Philadelphia 18, Pa. . . . or for more information check CP 5546 on form which is located opposite last page.)

Oscillation or 280° rotation of shaft using hydraulic or pneumatic pressure, without linkages . . .

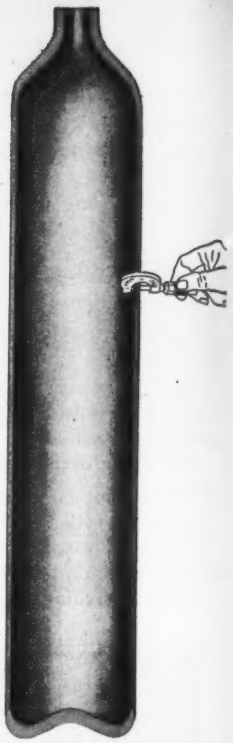
torque motor's square design eases mounting, requires minimum space in application

Uses: As a torque device for turning, opening, closing, clamping, indexing, feeding, locking, pushing, mixing, or moving any type of load or mechanism.

Features: Instant oscillating torque motor obtains up to 280° rotation, or oscillation, without the use of linkages, gearing, transmissions, reduction gears, rack and pinions, levers, cylinders, cams, or clutches.

Description: Unit operates with air, oil, water, or fire-resistant fluid pressure mediums. Square de-

How light should a gas cylinder be?



HARRISBURG Cylinders are made with an eye to the future and their ability to pass successive quinquennial tests.

They are as light as is consistent with *well-balanced design and construction.* Their most important characteristic is their unequalled uniformity of wall thickness. This unusual regularity effects an even distribution of strength throughout. There is not a weak point in a HARRISBURG Cylinder, no spot too thin or too thick.

For the sake of safety and long service life, buy HARRISBURG Gas Cylinders.

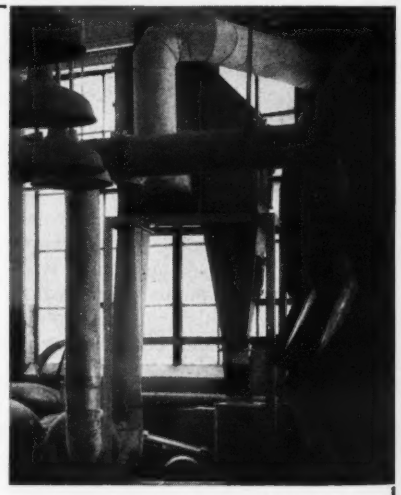
More than a century in Harrisburg

Harrisburg Steel CORPORATION HARRISBURG 24, PENNSYLVANIA

Due to uniformity of wall thickness there is no excess weight in a HARRISBURG Cylinder.

When inquiring check CP 5547 opposite last page

℞ for efficient dust control . . . DUSTEX

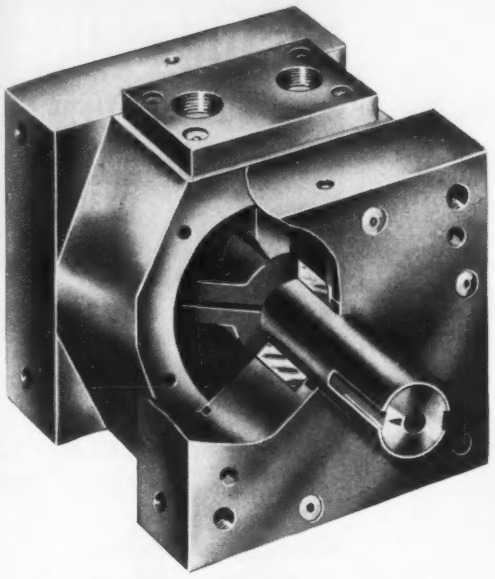


This 25 tube D-450 Dustex collector recovers airborne coating material from 24 coating pans during the manufacture of Doan's Pills at the Foster-Milburn Co., Buffalo, N. Y. The Dustex unit handles 1640 cfm at 80°F with a 6" w.g. pressure drop. Enthusiastic endorsement by coating department employees, reduction of good housekeeping costs, and recovery of material has proven the worthiness of this Dustex collector to management. Operation is maintenance free.

If you have a dust problem that hampers employee efficiency, or results in waste of valuable material, write for information on our simplified test method which proves performance . . . *before purchase.*

P.O. Box 2520 Dustex CORP. **Buffalo 25, N. Y.**

When inquiring check CP 5548 opposite last page



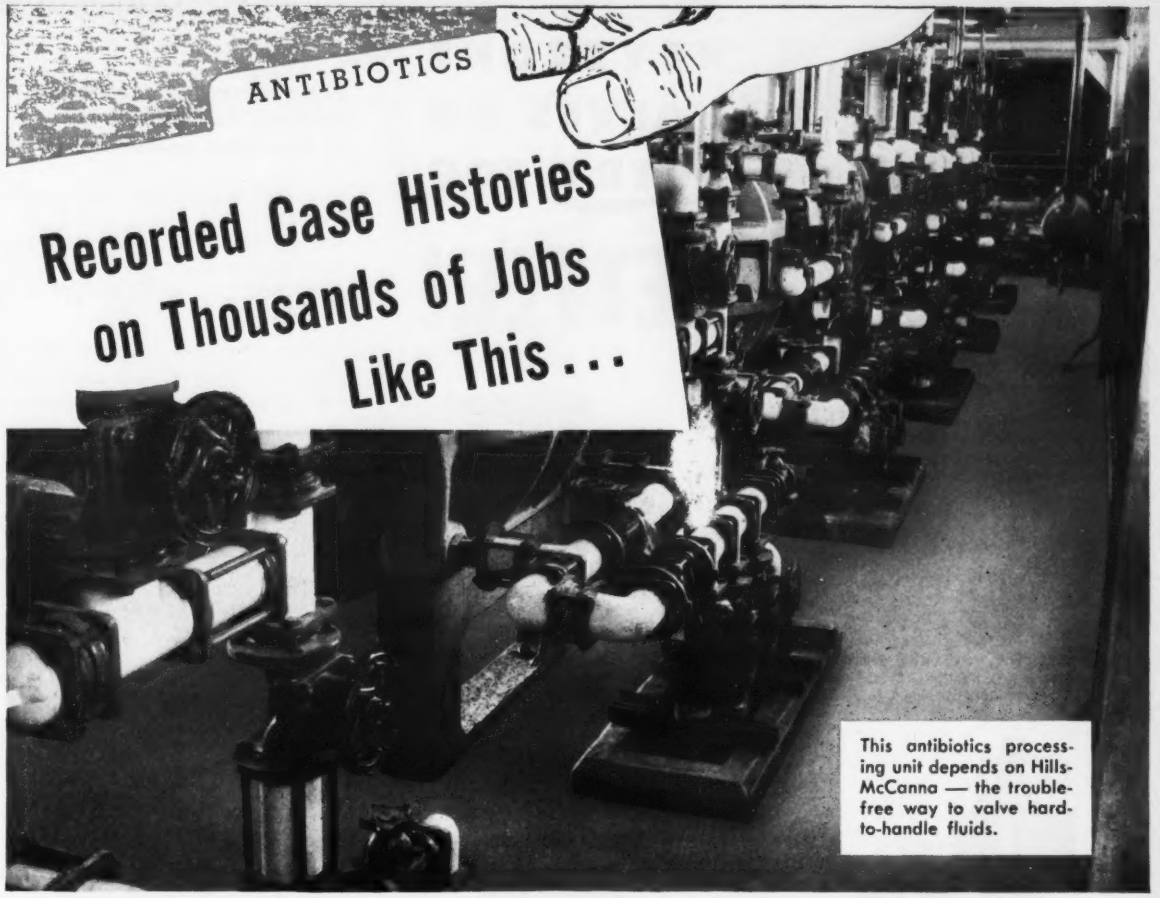
Oscillating torque motor will handle pneumatic or hydraulic pressures up to 1500 psi

sign requires minimum space in application and mounting can be made on any of six faces in 14 mounting models. Motors are rated to withstand pressures to 1500 psi. They have heavy steel heads, manifold piping, and oversize self-lubricating bronze bearings.

(Rotomation motor is a product of Roto-Mation Motors, Inc., Dept. CP, 525 S. Riverside, St. Clair, Mich. Check CP 5549 opposite last page.)

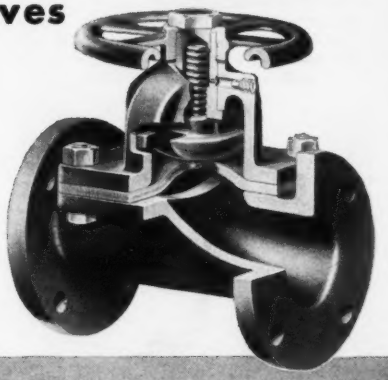
"That reminds me—we're having my wife's family over for dinner tonight!"

Cartoonist responsible for the laugh above is Nathan Milstein of Huntington Woods, Mich. He is Technical Director of C and M Pharmacal, Inc., and Technical Consultant for Frank W. Kerr Chemical Co., both of Detroit.



This antibiotics processing unit depends on Hills-McCanna — the trouble-free way to valve hard-to-handle fluids.

Provide the *Know-How* That Saves You Trouble and Expense in Valving Corrosives



The sum total of twenty years experience in valving virtually every conceivable corrosive substance is recorded in the application service records of Hills-McCanna. Here is proved on-the-job data on how to handle over 1000 corrosives . . . specific information on the best diaphragm materials and the best body and pipe materials. For you it means materials recommendations based on facts—not guesswork.

Put this know-how to work for you on your corrosion resistant valving problems by submitting these problems to Hills-McCanna. In Hills-McCanna valves you are offered a choice of 36 bonnet assemblies, 14 diaphragm materials and 27 body materials—a total of 9,121 ways to valve corrosives. To have full information at hand, ask for the Hills-McCanna valve catalog.

HILLS-McCANNA CO.

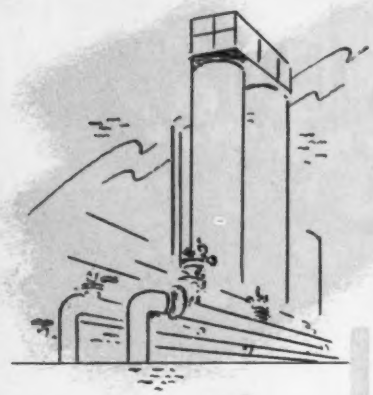
2370 W. Nelson St. Chicago 18, Illinois

Manufacturers of: Saunders Patent Diaphragm Valves • Chemical Metering and Proportioning Pumps • Force Feed Lubricators • Light Alloy Castings

...HILLS-McCANNA...

Corrosion Specialists Since 1870

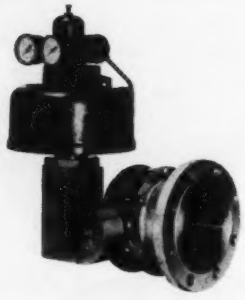
When inquiring check CP 5550 opposite last page



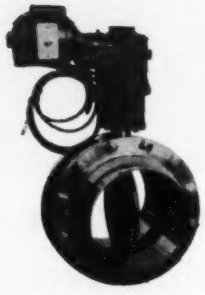
KEYSTONE VALVES DO EVERY JOB BETTER!

Standard valve with lever handle

Lug-Type valve with lever handle

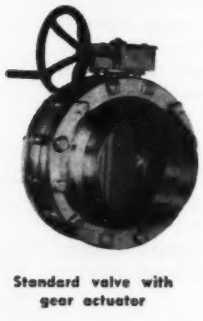


Standard valve with diaphragm actuator



Standard valve with electric actuator

Standard Valve with hydraulic actuator



Standard valve with gear actuator

SIZES, 1" THROUGH 48". WRITE FOR COMPLETE INFORMATION

KEYSTONE VALVE CORP.

P. O. Box 6716 Telephone JA 3-1623 Houston, Texas

Representatives in principal cities throughout the world.

The ORIGINAL Design Bubble-Tight Closure • No Gaskets Required • Securely Fastened Seats

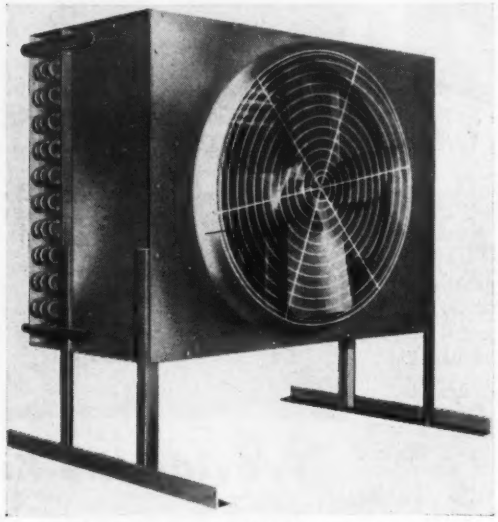
When inquiring check CP 5551 opposite last page

Extra protection against rust provided on steel cabinet of air-cooled condenser . . .

cabinets are coated with vinyl and rubber

Uses: Providing condenser capacity for air conditioning systems when water is unavailable, water costs are high, or disposal of surplus water is a problem.

Features: Cabinet of unit is fabricated from heavy-gage sheet steel which is coated with a vinyl plastic and chlorinated rubber to provide long lasting protection against rust.



Air-cooled condenser can be floor or ceiling mounted

Description: Coils are designed to give uniform air distribution throughout core. Units are available in capacities from 2 to 20 tons with aluminum or copper fins. Deep pitch, four-bladed fan gives high air volume at low speeds and insures quiet operation.

Condenser may be floor or ceiling mounted and is designed for multiple circuit operation. Wind deflectors are available for outside applications.

(Air-cooled condensers are a product of Halstead and Mitchell, Dept. CP, Bessemer Bldg., Pittsburgh 22, Pa. . . . or check CP 5552 opposite last page.)

Process heating by hot oil

Economies and engineering aspects of fully automatic, electrically-heated, hot-oil systems are subject of four-page bulletin. Systems can be used for heating to any point from 150 to 600°F.

Bul 1255 is available from Parks-Cramer Co., Dept. CP, 444 Rose, Fitchburg, Mass. When inquiring specify CP 5553 on form opp. last page.

PUMPS for the PROCESSING INDUSTRY
...that SERVE WELL and LAST!
CORROSION
EROSION
or other
PHYSIO-CHEMICAL
PROBLEMS
?
Fig. 19,488
TABER
BUFFALO, N.Y.
To Chemical Engineers who cope with such problems: Taber builds pumps of metals or alloys which the Engineer has found effectively resistant to the specific chemical solution to be pumped. Stability of Taber design never gives way to design for selling purposes. You can get repair parts or duplicate Taber pumps for years.
SUGGESTION: On your business stationery, WRITE FOR:
BULLETIN V-837
TABER PUMP CO. Est. 1859
320 ELM ST., BUFFALO 3, N.Y.

When inquiring check CP 5554 opposite last page

Provide improved heat transfer between process equipment and tracings . . .

thermal conducting cements can be molded or applied by a caulking gun

Uses: In conjunction with steam or electrical tracings or cooling lines to heat or cool process equipment such as valves, pipes, tanks, or columns.

Features: Compound enlarges contact area between tracing and equipment, improving thermal conductivity by more than 11 times. Product can be supplied suitable for molding or application with a caulking gun.

Description: Cement consists of an inorganic binder and non-metallic powders that are fire and rot proof. Tracit-100 is moldable and fluid and requires molds to form it in desired shape. Tracit-200 is designed specifically for application with a caulking gun. Thermal conductivity of first is 47 Btu/hr/sq ft/°F/in. Second compound has thermal conductivity of 22. Maximum temperature recommended for continuous use is 800°F.

(Tracit-100 and 200 are products of Chemax Manufacturing Corp., Dept. CP, 900 Wilmington Rd., New Castle, Del. . . . or for more information check CP 5555 on form opposite last page.)

Roller speeds are variable from 126 to 300 rpm on jar mill . . .

long roll units handle ½-pint to 6-gal jars using three-position lateral adjustment

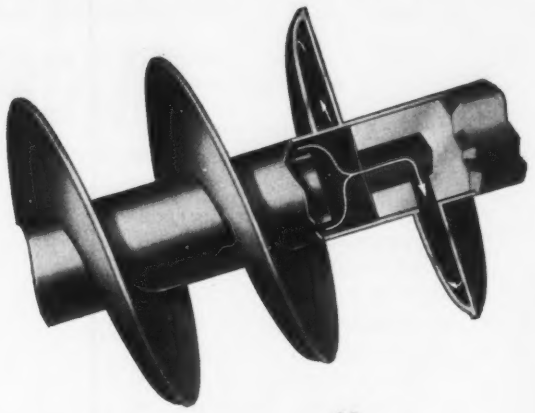
Uses: Pulverizing, grinding, mixing, or extracting of wet or dry materials for batch operations in laboratory, pilot plant, or plant-scale production.

Features: Roller speeds on long-roll jar mill are variable from 126 to 300 rpm. Units will handle all mill jar sizes from ½ pint through 6 gallons by utilizing three-position lateral adjustment on idler rollers.

Description: Jar mills are available in one or two tiers with roller lengths from 16 to 66". Rollers are 3" in diameter and are fabricated from long-wearing, chemical- and solvent-resistant neoprene rubber on cores of 2" hollow steel. Ball bearing pillow blocks are sealed. Units are compactly mounted on welded steel frames to occupy a minimum of space. Explosion-proof motors, clutches, and drives are available.

(Long-Roll jar mills are a product of Process Equipment Div., U. S. Stoneware, Dept. CP, 5300 Talmadge Ave., Akron 9, Ohio . . . or for more information check CP 5556 on form which is located opposite last page.)

A great new advancement in heat exchangers...

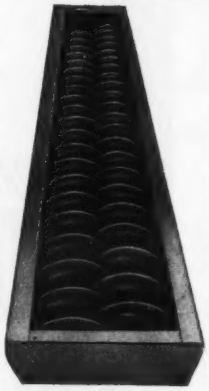


THE holo-flite* PROCESSOR
(HOLLOW-FLITE)

A simpler, more compact way to cool slurries, solids or pastes—in continuous flow!

Do you have processes where slurries, solids, pulps or pastes must be cooled or cooked? Do you know you can now handle such processes—*in continuous flow*—in as little as 1/5th the space required by other types of heat exchangers—and with many other important advantages?

The newly-developed HOLO-FLITE Processor is the answer!



what IT IS!

Basically the HOLO-FLITE consists of two or more flights of hollow-bladed screw conveyors. The product to be processed moves in a trough around the conveyor screws. The heat-transfer fluid circulates through the hollow blades and shafts of the conveyor. The product is constantly rotated into, around, under and over the blades and shafts through which the heat-transfer fluid is circulating, assuring quick, uniform heat passage between the two mediums—*as the product is continuously moved along in a bulk-flow without interruptions!*

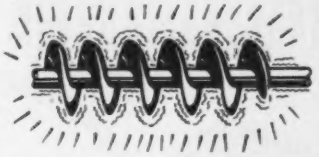
Get the complete story on HOLO-FLITE *savings and how this new advancement can simplify your processing operations. It is backed by the same organization that pioneered* COTTRELL *Precipitators and* MULTICLONE *Collectors—your assurance of complete dependability.*

*Reg. T.M.

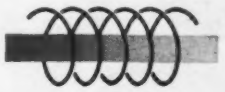
DETAILED INFORMATION! New 8 page bulletin describing HOLO-FLITE features and applications will gladly be sent on request. Write, wire or phone for your free copy!

why IT'S BETTER!

The HOLO-FLITE principle provides many important advantages in modern processing operations...



ITS LARGE HEAT-TRANSFER SURFACE requires far less space—as little as 1/5th the space required by other heat-exchange equipment. Further, flights can be "stacked" as high as desired to save floor space, simplify installation!



ITS SLOW ROTATION IS SO GENTLE that granular and powdered solids are handled with no dusting—little or no particle abrasion. Result—no dust recovery problems . . . simple, inexpensive installation.

IT IS ADAPTABLE to a wide range of applications—handles solids, pulps, pastes and slurries with equal ease. Heat transfer agent can be refrigerant, water or other fluids to provide a wide range of temperatures. Cooled products can be packed directly from HOLO-FLITE discharge, saving time, space and additional handling.

IT CAN BE DESIGNED to handle virtually any capacity by varying the diameter and length of the flights, and the number of "tiers."

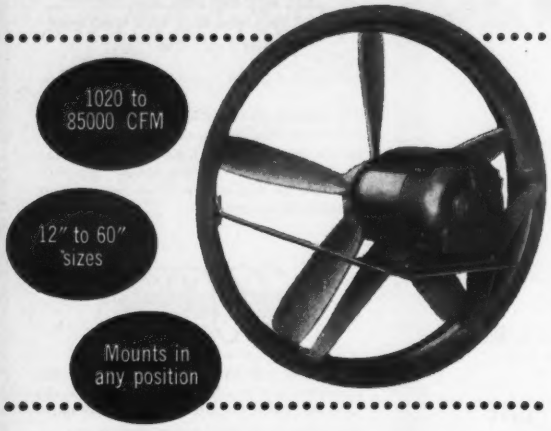
WESTERN Precipitation CORPORATION

DESIGNERS AND MANUFACTURERS OF EQUIPMENT FOR COLLECTION OF SUSPENDED MATERIALS FROM GASES & LIQUIDS

Main Offices: 1023 WEST NINTH STREET, LOS ANGELES 15, CALIFORNIA
CHRYSLER BLDG., NEW YORK 17 • 1 N. LA SALLE ST. BLDG., CHICAGO 2
OLIVER BLDG., PITTSBURGH 22 • 3252 PEACHTREE RD. N.E., ATLANTA 5
HOBART BUILDING, SAN FRANCISCO 4
PRECIPITATION CO. OF CANADA, LTD., DOMINION SQ. BLDG., MONTREAL

When inquiring check CP 5557 opposite last page

Most versatile of all industrial fans



PROPELLAIR TYPE "CD" DIRECT CONNECTED FAN

Use this heavy-duty fan for ventilation . . . to exhaust heat, dust, moisture, fumes and smoke. It's powerful, dependable, efficient. Use it in ductwork, hoods, roof ventilators, wall mountings or for air circulation and cooling. Engineered to move a lot of air at low cost.

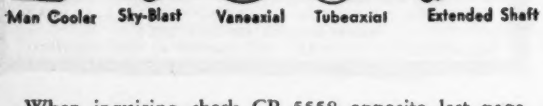
You get these important features:

- Cast aluminum airfoil propeller for greater efficiency
- Dependable R & M *All-Weather* Motor direct connected for long, trouble-free service
- Venturi entrance ring with tip seal to create efficient air flow
- Rugged steel motor support arms welded to entrance ring
- Explosion-proof and glass-insulated motors available
- Fan and motor covered by a single Robbins & Myers guarantee

Certified Ratings AMCA

Write for Bulletin 690-C

R&M PROPELLAIR® DIVISION OF ROBBINS & MYERS, INC. SPRINGFIELD · OHIO



When inquiring check CP 5558 opposite last page

Grease for pumps, valves handling caustic or acid . . .

will withstand temps over 400°F has water resistance

Uses: Lubricating pumps and valves handling caustic or acid solutions.

Features: Lubricant has excellent resistance to acids and bases. It has working stability and oxidation resistance.

Description: Material will withstand temperatures over 400°F, has excellent water resistance. An anti-seizing compound, incorporated in the formulation, and high metal adhesion qualities make it particularly suitable for plug valves. Grease is available in No. 2 grade in 25-lb pails, 100 and 500-lb drums.

(TS-23 lubricant is a product of Tri-State Petroleum Co., Dept. CP, 81st & Eastwick Ave., Philadelphia 42, Pa. Check CP 5559 on form which is located opposite last page.)

Pressures to 3000 psi provided at 1.75 cfm by 38 lb compressor . . .

unit supplies oil free air with no moisture content

Uses: Providing low volume high pressure air for pressurizing actuators, receivers, and accumulators. Particularly suitable for testing laboratories, or processing, service and maintenance departments where intermittent supplies of high pressure air are required.

Features: Portable compressor unit has a capacity of 1.75 cfm of free air and a rated discharge pressure of 3000 psi. It weighs only 38 lb and has an overall height of 17". Unit delivers oil and moisture-free air.

Description: Complete assembly includes compressor, oil filter and moisture separator, self resealing relief valve, 0-4000 psi pressure gage, and an integral 110-220v,

If Your Filter Medium Is Blinding Or Clogging The Use Of E & D Filter Paper As A Cover May Be Indicated!

Many commercial filtration processes are troubled with slurry that contains slimy fines, gelatinous or minute particles. In a large number of such cases the use of E & D filter paper as a "cover" over the filter medium will provide finer filtration while protecting the medium. The cost of the paper is sufficiently low to warrant peeling it off and discarding after use leaving the medium underneath relatively clean. Savings in production time can be substantial.

Write for our FILTRATION ANALYSIS REPORT. We will recommend the proper grade for your use and send free samples for testing.

E&D FILTER PAPER

THE EATON-DIKEMAN CO.

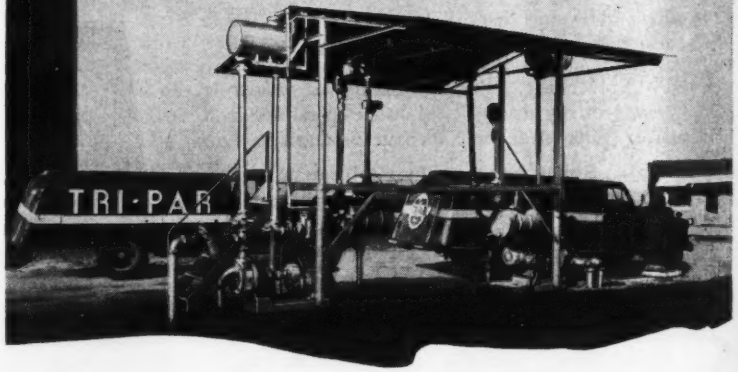
FILTERTOWN

MT. HOLLY SPRINGS, PENNA.

The only company in America exclusively devoted to the manufacture of filter paper for science and industry.

When inquiring check CP 5560 opposite last page

FAST PUMPING WITH VIKINGS in EITHER *DIRECTION*



TRI-PAR Oil Company, Saukville, Wisconsin, makes good use of Viking Pump's reversible feature. The pumping system has a single suction line and a single discharge line which can be operated in either direction, eliminating the piping manifold. Speeded to deliver 325 G.P.M. the pumps can unload transports to storage and load delivery trucks from storage by merely reversing action. Pumping units have lost no time from their operation, during the three years they have been in service, and have handled approximately 25,000,000 gallons of gasoline and fuel oil in that period.

Perhaps Viking Pumps can speed your operation and simplify your pumping. Types and sizes for most industrial pumping. For information, write for Bulletin 56Scc.

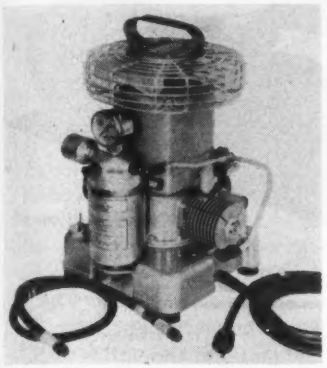
VIKING PUMP COMPANY

Cedar Falls, Iowa, U.S.A. In Canada, it's "*ROTO-KING*" pumps

See our catalog in Sweets

When inquiring check CP 5561 opposite last page

60~ AC electric motor. Compressor operates at 3450 rpm and has three stage of compression. Unit is air cooled and carrying handle is located at top of fan guard.



Portable compressor unit has convenient carrying handle

(Model 130R1500 compressor is a product of The Cornelius Co., Dept. CP, 550 39th Ave. NE, Minneapolis 21, Minn. . . . or check CP 5562 on the convenient Reader Service slip which is located opposite last page.)

Yellow-green slide rule increases readability prevents eye-strain . . .

light-alloy units reflect light at optimum sight point

Light-alloy slide rules have a yellow-green tint that increases readability and prevents blurring and eye-strain. Errors in reading calibrations are reduced. Rays reflected by rule coincide with optimum sight point of spectrum.

Units are fabricated from non-corroding metal. They are supplied in 6 and 10" Trig, Log-Log standard rules, or in rules made to special order.

(Yellow-green slide rules are a product of Pickett & Eckel, Incorporated, Dept. CP, 1109 S. Fremont Avenue, Alhambra, California . . . or for more information about manufacturer's product, reader may simply check CP 5563 on form opposite last page.)

FOAMGLAS®

the cellular, stay-dry insulation

"FOAMGLAS solved our sphere insulation problem because it stays dry, stays effective"

states U.S. Industrial Chemicals Company

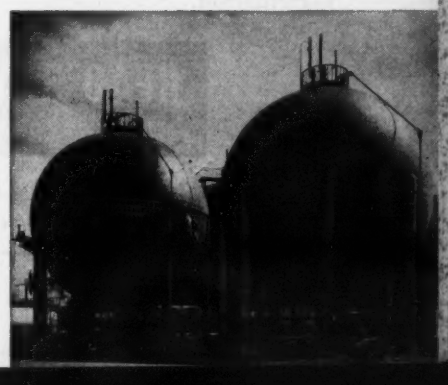
National Distillers Products stores anhydrous ammonia in four 55-ft. diameter spheres at their U. S. Industrial Chemicals Division plant in Tuscola, Ill. Pressure has to be controlled at 55 p.s.i. by holding temperature at 26°F. That calls for insulation that won't lose efficiency, and U.S.I. reports, "We solved the problem with FOAMGLAS."

They explain: "This cellular glass insulation isn't affected by spillage, acid atmospheres or moisture. That means we get dependable temperature control. Even under our blistering summer sun, heat gain in the spheres is only hundreds of B.t.u.'s per hour; not the usual thousands."

FOAMGLAS saved installation time and money for U.S.I., too. They found that "the light, strong, rigid blocks were easy to cut, shape and handle. Best of all, the material's high insulating value made only one 3-in. layer necessary."

These benefits and more can be *yours* when you insulate spheres, piping, equipment or buildings with FOAMGLAS. Prove it yourself with a series of six simple tests easily performed in your own office. Write us today for a free sample and complete testing directions.

Installing FOAMGLAS on these four U.S.I. spheres was simplified by the material's light weight and handling ease. Each block of insulation was impaled on studs welded to the sphere plates. Joints were then sealed and asphalt cutback was sprayed on as a finish. Insulation Contractor was Heat Lock Corp., Indianapolis, Ind.



Pittsburgh Corning Corporation

Dept. CP-56, One Gateway Center
Pittsburgh 22, Pennsylvania

In Canada: 57 Bloor St. W., Toronto, Ontario

When inquiring check CP 5564 opposite last page

4 years of gruelling operation frequently at overload pressures and still no maintenance needed

Since 1951, Standardaire Blowers installed at Spencer Chemical Company have been operating 24 hours a day supplying process air for production of synthetic ammonia.

Although normally operated at 1750 rpm and 8 psig, these units periodically are required to run at more than 50 percent above rated capacity for as long as a month at a time. When brick and catalyst dust seal over reformer catalyst beds, this pressure is needed to force the gases through and avoid costly shutdowns.

After four years of this gruelling, continuous operation, a recent test disclosed virtually no reduction in efficiency of the Standardaire Blowers. They have required no maintenance.

Exclusive cycloidal design and simple, compact construction enable Standardaire Blowers to move more gas or air per pound of blower, with less wear, less maintenance and power consumption. Write for complete information.

READ STANDARD
CORPORATION

BLOWER-STOKER DIVISION
370 LEXINGTON AVENUE, NEW YORK 17, NEW YORK

When inquiring check CP 5565 opposite last page

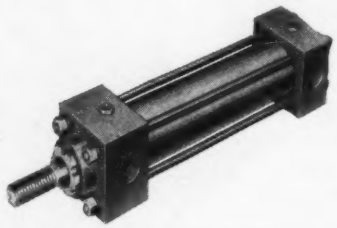
Square-end cylinders are now available from stock . . .

line will utilize air or oil in five bore sizes

Uses: Cylinders provide pneumatic or hydraulic force in heavy-duty applications.

Features: Non-rotating, double-acting, square-end cylinders were previously available only on special order. Five bore sizes from 2 to 6" handle air pressure to 150 psi and oil pressure to 500 psi.

Description: Five basic mounting styles are available with interchangeable covers permitting multiple mounting combinations. Pistons are of high-quality steel construction. Rods are extra-heavy to carry high impact loads. Rod wipers assure dirt-free rod on instroke.



Interchangeable covers on square-end cylinders permit multiple mounting combinations

(Ultra-mation cylinders are available from Logansport Machine Co., Dept. CP, Logansport, Ind. . . . or for more information check CP 5566 on form opposite last page.)

Series of drawings used to show regulators

Series of engineering drawings contained in 36-page bulletin shows construction details of several regulating valves. Included among these are: series safety arrangement, valve shut-off arrangement, secondary control line, and many more.

Bul 1094 is issued by Meter & Valve Div., Rockwell Mfg. Co., Dept. CP, 400 N. Lexington Ave., Pittsburgh 8, Pa. Specify CP 5567 opposite last page.

PUMP

Liquids • Gases • Slurries

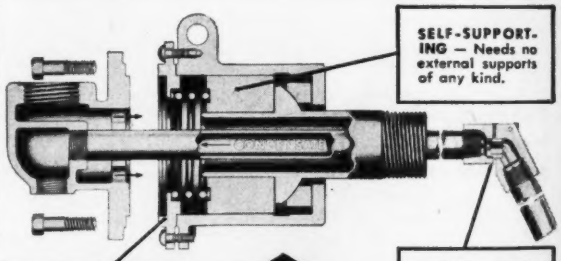
WITHOUT CORROSION OR CONTAMINATION

Write for Catalog

Prices range from ..... $55 to $500
depending on size of pump and accessory equipment required.

SIGMAMOTOR Inc.
18 North Main Street • Middleport, N. Y.

When inquiring check CP 5568 opposite last page


SELF-SUPPORTING — Needs no external supports of any kind.
ASSEMBLY PLATE — Holds internal parts in position when head is removed.
SYPHON ELBOW — Permits use of straight pipe for syphon. Can be inserted or withdrawn right through the joint.

Johnson Rotary Joint with SYPHON ELBOW

Johnson Joints represent the best way industry has yet found to get steam or liquids into rotating rolls and cylinders. They are completely packless, need no lubrication or adjustment. The Type SBP shown gets steam in, condensate out, through the same head. Other types available for through flow service, in sizes to meet all operating needs. ***WRITE FOR COMPLETE INFORMATION.***

The Johnson Corporation
826 Wood St., Three Rivers, Mich.

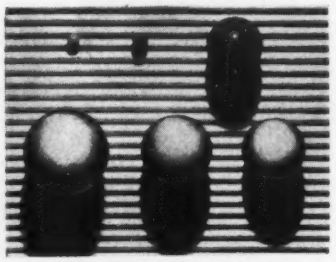
When inquiring check CP 5569 opposite last page

High corrosion resistance and close tolerances mark ceramic balls . . .

resist dry chlorine, nitric and hydrochlorine acids

Uses: Can be used in check valves, flow meters, and as precision ball bearings for pumps requiring resistance to corrosion, abrasion, or high temperatures.

Features: Precision balls of synthetic and natural ceramic materials are chemically inert to acids, alkalis, and most corrosive substances including dry chlorine. Accuracy is



Ceramic balls are furnished in sizes from 1/4 to 4 1/2"

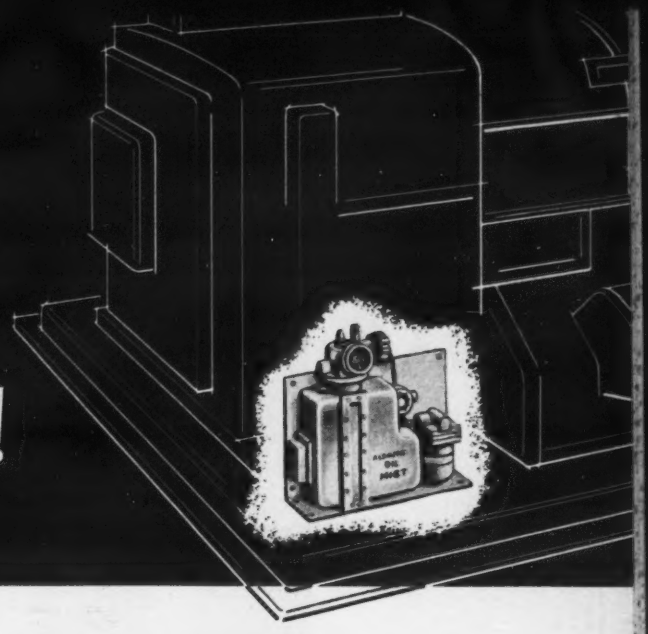
held to ± 0.0002" on size and 0.000050" on sphericity in smaller sizes, and to 0.0005" and 0.0002" respectively on 4½" balls.

Description: Units can be manufactured from aluminum silicates, magnesium silicate, titanium dioxide, and aluminum oxides, including sintered sapphire. Properties include high dielectric strength, zero water absorption, low thermal conductivity, and good shock resistance. Hardness is approximately equivalent to that of tungsten carbide. Compressive strength is generally over 300,000 psi. Balls can be furnished in any standard or special size from ¼ to 4½".

(Ceramic balls are products of Industrial Tectonics, Inc., Dept. CP, Ann Arbor, Mich. . . . or for more information check CP 5570 on form opposite last page)

For more information on product at right, specify CP 5571 . . . see information request blank opposite last page.

save up to 90% on lubricating costs!



ALEMITE OIL-MIST AUTOMATIC LUBRICATION

multiplies bearing life...cuts product spoilage ...boosts machine output in almost every industry!

Alemite Oil-Mist Automatic Lubrication brings remarkable savings . . . in lubricants, man-hours, bearing life, and decreased product spoilage.

Alemite Oil-Mist *atomizes* oil into mist—distributes it through tubing to bearings—bathes all bearing surfaces with a cool film of clean oil. Maintains uniform oil film on plain and anti-friction bearings, gears and chains—despite variations in load, temperature or speed. Amazingly simple, continuous and fully automatic . . . Alemite Oil-Mist eliminates the waste and uncertainties of the "human element" in lubrication.

Let us show you how Alemite Oil-Mist provides more efficient, foolproof lubrication, at lower cost! Mail coupon below for a graphic demonstration!

8 ADVANTAGES of the ALEMITE OIL-MIST System

1. Continuous Lubrication—Constantly deposits fresh, clean film of oil on all surfaces of all bearings in the system.

2. Fully Automatic Lubrication—Can start and stop with operation of machine switch.

3. Elimination of Guesswork—No bearing can be over-looked, nor over-lubricated! Every bearing picks up only as much Oil-Mist as it needs.

4. Reduction of Bearing Temperatures—Acts as bearing coolant, can lower bearing temperatures as much as 20° F.

5. Reduction of Types of Oil—Reduces number of oils that must be stocked, handled, and applied.

6. Elimination of Downtime—All bearings in the system are constantly lubricated while machines continue to operate.

7. Extension of Bearing Life—Multiplies bearing life many times. Life of grinding machine bearings has been extended from 400 to 7,000 hours!

8. As High As 90% Less Oil Consumption—Alemite Oil-Mist usually consumes about 1/10 the amount consumed by any other oiling method!

Alemite Oil-Mist Lubricates ALL Types of Mechanisms

Anti-friction Bearings | Plain Bearings | Chain | Gear | Gear Cases

A PRODUCT OF SW STEWART WARNER

ALEMITE
REG. U. S. PAT. OFF.

A Product of STEWART-WARNER CORPORATION

Alemite Division of Stewart-Warner, Dept. D-56
1850 Diversey Parkway, Chicago 14, Illinois

☐ Please send me a FREE copy of your new and complete Oil-Mist catalog.

☐ Please have your Alemite Lubrication Representative arrange a no-obligation demonstration.

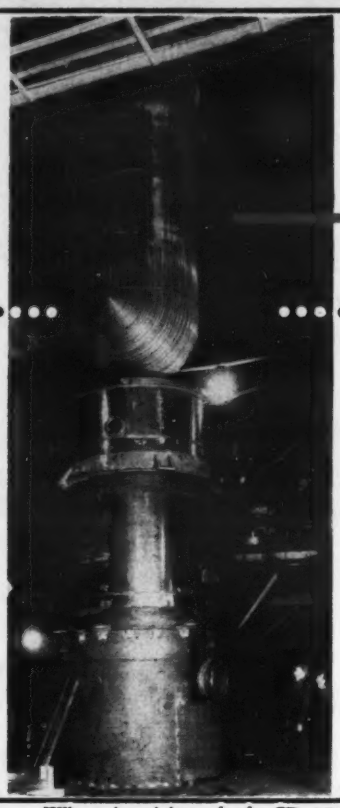
My Name .....

Title .....

Company .....

Street .....

City ..... State .....



BIG.....

ALBERGER
HEAT EXCHANGE EQUIPMENT

.....BIG *in design*
in manufacture
in performance

In the 52 years Alberger has been in business, it has made more than 40,000 installations of heat exchange equipment for process industries in the United States and in countries throughout the world.

The massive vapor condenser, shown here being assembled, is an example of Alberger's outstanding ability. Built for the National Aniline Division of Allied Chemical & Dye Corp., the condenser's Herculoy shell weighed 12 tons and its 25-ton tube bundle contained 12¼ miles of copper tubing carefully bent into 2150 U-tubes.

In all Alberger Heat Exchangers, heating surfaces are scientifically arranged to *increase heat transfer* and compactly assembled to *save space*.

ALBERGER HEATER DIVISION
ADSCO INDUSTRIES, INC.
20 MILBURN ST. BUFFALO 12, N. Y.

When inquiring check CP 5572 opposite last page

DON'T LET CORROSION EAT UP YOUR PLANT—
STOP IT NOW WITH

Steelcote **EPO-LUX**

SURPASSES ALL OTHER TYPE COATINGS IN CORROSION RESISTANCE

Surfaces never before paintable can now be given a protective coating of beauty and color; surfaces exposed to hot alkali and acid liquids or fumes can now be protected for years. EPO-LUX dries to 75% of the hardness of glass. yet never gets brittle. Solutions that eat up metal do not affect it. The word "Epo-Lux" on your letterhead mailed to us will bring you specification data.

Write Dept. S.

STEELCOTE MANUFACTURING COMPANY, 3418 GRATIOT, SAINT LOUIS 3, MISSOURI

When inquiring check CP 5573 opposite last page

Pilot-operated check valve has eight gpm capacity, holds up to 2000 psi . . .

extends range of company's gasket-mounted units for industrial oil-hydraulic systems

Uses: Traverse and feed circuits, holding vertical loads, and similar duty applications.

Features: Check valve's rated capacity of eight gpm in systems with operating pressures up to 2000 psi extends company's line of pilot-operated, gasket-mounted units for industrial oil-hydraulic systems.

Check valve requires pilot pressure greater than 40% of system pressure to open

Description: Unit is of spring-closed, poppet-type construction to provide uniformly consistent operation regardless of mounting position. Valve requires pilot pressure greater than 40% of system pressure to open and is available with cracking pressures of 30, 75, or 150 psi.

(Model 4CG-03 check valve is a product of Vickers Inc., Div. of Sperry Corp., Dept. CP, 1400 Oakman Blvd., Detroit, Mich. . . . or for more information check CP 5574 on form opposite last page.)

The alphabetical Product Directory (starting on page 234) will give you a page reference to all articles and advertisements in this issue

Patches and resurfaces concrete without chipping or cracking in thin sections . . .

material can be feathered out to a fine edge without loss of bond

Uses: Patching and resurfacing concrete and similar surfaces and to repair concrete columns, steps, and window sills.

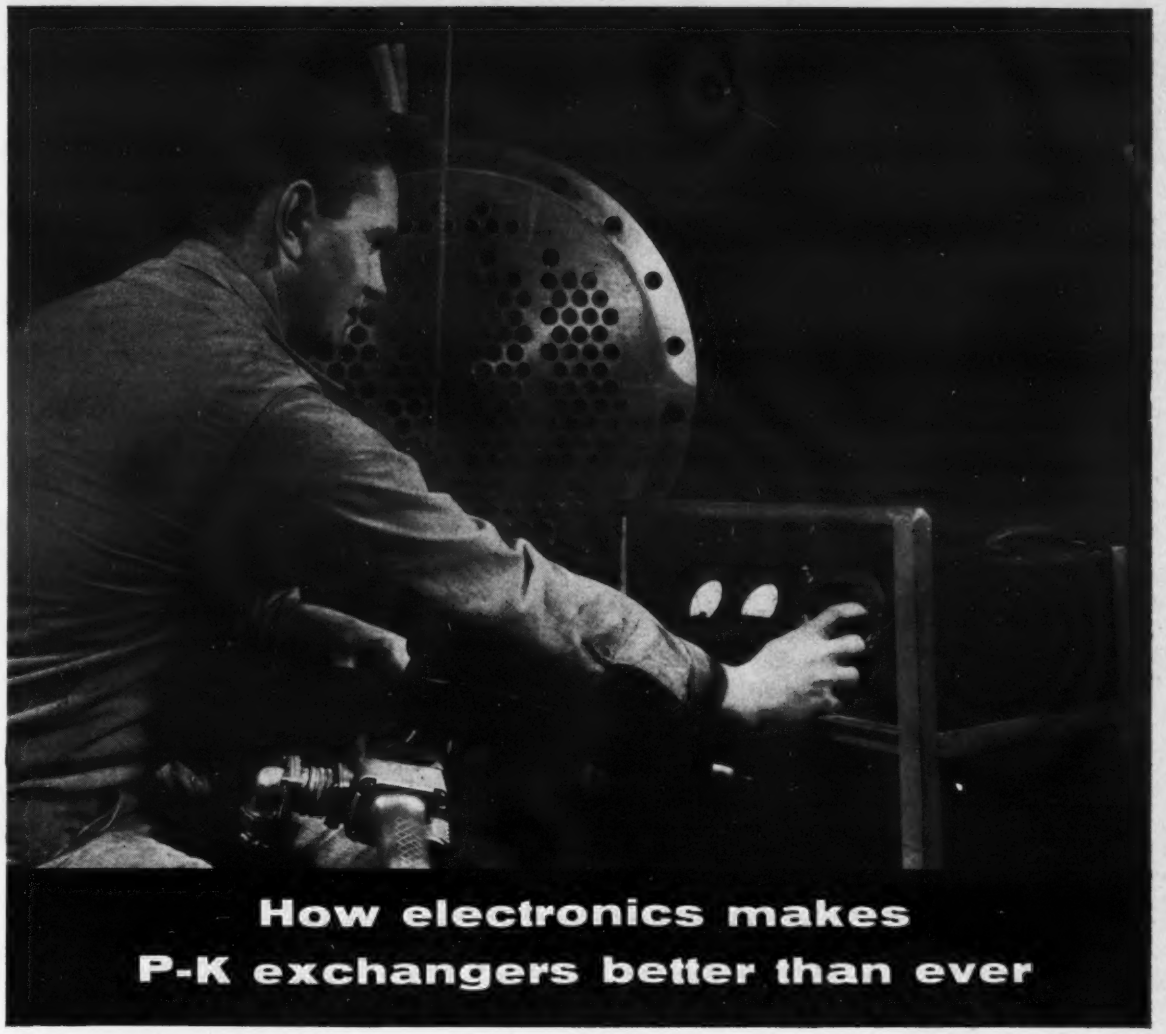
Features: Material has adhesion to concrete that is stronger than original concrete. It can be laid down in thin sections and feathered out to a fine edge without chipping, cracking, or losing bond around edges.

Description: Compound consists of an aggregate of crushed sharp silica sand, 80% of which passes through a 50 mesh screen, and a waterproofed dispersion of synthetic resin as a binder. Components are mixed just prior to application. No water is added. Less than five days are required for patch to attain tensile strength of concrete. It resists all straight chain hydrocarbons such as gasoline, grease, and oils as well as ethylene glycol, glycerine, naphtha, and vegetable oils.

(Erco-Crete patch and resurfacing compound is a product of Earl Paint Corp., Dept. CP, 240 Genesee St., Utica 2, N.Y. . . . or for more information check CP 5575 on form opposite last page.)

"We built it this way to give our employes a feeling of belonging."

Credit W. R. Symonds with this cartoon idea. He's Process Supervisor with Procter & Gamble in Cincinnati.



This man is expanding tube ends into the tube sheet—the "inner face" of a shell and tube heat exchanger that holds each tube in place. By doing it electronically, with the equipment you see here, the circumference of each tube is joined to the face of the exchanger with exactly the same pressure.

This minimizes the possibility of leaks developing—even when a mile of tubing and hundreds of tube ends are involved, as they are in many of P-K's special exchangers.

But fabricating procedures like these are only part of the story. Every P-K unit is "computed" for its thermal rating and design.

This automatic check of a unit's thermal rating is not only a safeguard, but can often save you money. And it allows P-K to give a full and complete guarantee that each unit will perform at its rated heating or cooling capacity.

An increasing number of processors, engineers, and contractors have come to rely on P-K's painstaking fabrication and testing procedures —and their check, and double-check, of a unit's thermal rating. We would be pleased to design and build exchangers for you.

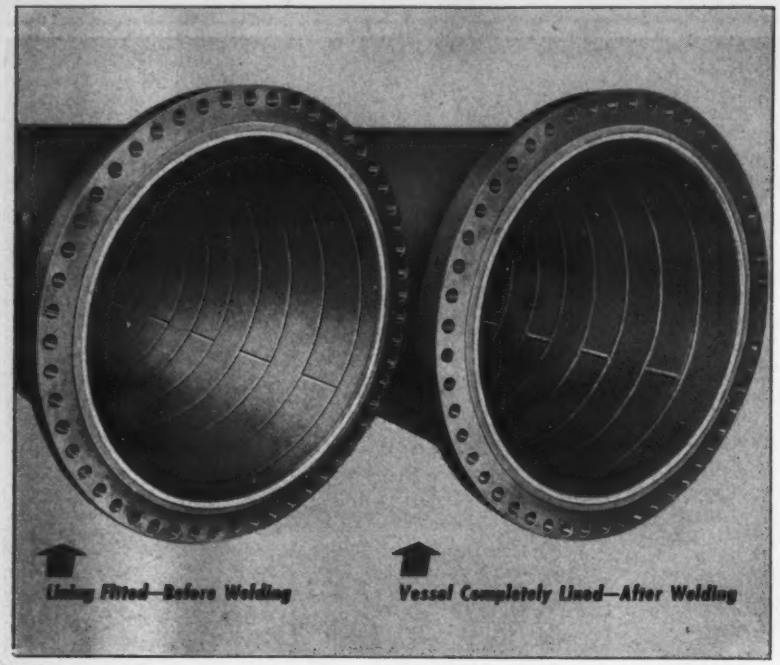
The Patterson-Kelley Co., Inc., 750 Hanson Street, East Stroudsburg, Penna. Offices in principal cities.

PATTERSON KELLEY

2592

Heat Exchangers • Converters • Storage Water Heaters • Condensers • Storage Chillers • Oil Heaters • and all types of heat transfer equipment

When inquiring check CP 5576 opposite last page



For Special *Lined* Processing Vessels Come to STRUTHERS WELLS

LINING processing vessels of all kinds for chemical plants and refineries is another service in which Struthers Wells specializes. Years of engineering experience and extensive fabricating facilities enable us to build lined vessels that meet all codes and requirements.

The vessel illustrated is Inconel-lined, 36" I.D. x 43' high. Working pressure is 600 lbs. Lining is welded to outer wall to become an integral part of the processing vessel.

Vessels can be furnished lined with titanium, stainless steel, nickel, silver, hastelloy and other weldable metals to suit your applications.

STRUTHERS WELLS PRODUCTS

BOILER DIVISION—BOILERS for Power and Heat . . . High and Low Pressure . . Water Tube . . . Fire Tube . . . Package Units

PROCESSING EQUIPMENT DIVISION—Crystallizers . . . Direct Fired Heaters . . . Evaporators . . . Heat Exchangers . . . Mixing and Blending Units . . . Quick Opening Doors . . . Special Carbon and Alloy Processing Vessels . . . Synthesis Converters

FORGE DIVISION—Crankshafts . . . Pressure Vessels . . . Hydraulic Cylinders . . . Shafting . . . Straightening and Back-up Rolls

MACHINERY DIVISION—MACHINERY for Sheet and Structural Metal Forming . . . Tangent Benders . . . Folding Machines . . . Roller Table and Tumble Die Bending Machines . . . Press Brakes . . . Punching and Notching Machines . . . Forming Dies

Why not utilize this specialized experience on your equipment?

STRUTHERS WELLS CORP.

Struthers Wells

TITUSVILLE, PA.

PLANTS AT TITUSVILLE, PA. AND WARREN, PA.

Offices in Principal Cities

When inquiring check CP 5577 opposite last page

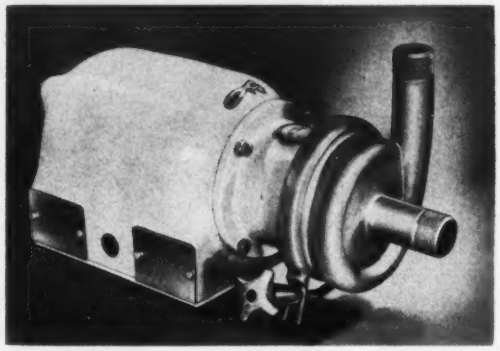
Can be disassembled in 30 seconds for cleaning, impeller change . . .

pump has 316 stainless contact surfaces, handles 200 gpm at 95-ft head

Uses: Foamless pumping of industrial liquids up to 120,000 lb/hr.

Features: Take-apart design of centrifugal pump permits disassembly in 30 seconds, without tools, for cleaning or changing impellers. All contact surfaces are 316 stainless steel. Unit will handle up to 200 gpm at a head of 95 ft.

Description: Pump will take acme thread, flange, cleaned-in-place lines, or standard IPS connections. Adjustable discharge can be positioned to fit requirements. Units are available in nominal 1½ and 2" sizes. Motors from ¾ to 10 hp provide full capacity ranges.



Centrifugal pump unit takes any of five pipeline connections

(Flexflo industrial pumps are a product of Cherry-Burrell Corporation, Dept. CP, 427 W. Randolph St., Chicago 6, Ill. . . . or for more information check CP 5578 on form opposite last page.)

Thumb and finger are only "tools" that are needed to disconnect or connect fitting . . .

provides strong, torque-free, leakproof seals at all plastic or metal tube connections

Uses: Quick-connect coupling for plastic or metal tubing.

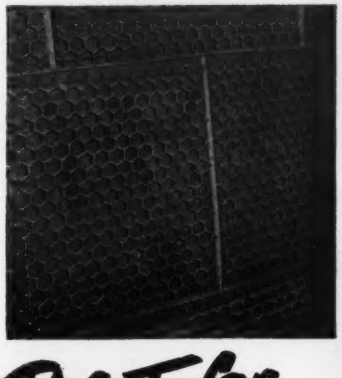
Features: Fitting is easily connected and disconnected — thumb and finger are only tools needed. Seal is strong, torque-free, and leakproof.

Description: Units are available in all metals, in sizes to fit ordinary applications. Styles are supplied for tube-to-tube, tube-to-pipe, or bulkhead connection. Shutoff valve, incorporated in fitting, prevents

RIGHT WHERE IT COUNTS!

IRVING "GRIDSTEEL" CONTOUR RETAINER MESH

Used with Castable Ganister Linings in Refractionating Units in Petroleum & Chemical Industries



RIGHT for

- ★ Thermal Cracking Units
- ★ Cyclones
- ★ Fluid Catalytic Regenerators
- ★ Fluid Catalytic Reactors
- ★ Hydroformers & Reactors
- ★ Flue-Gas Stacks & Ducts
- ★ Catalyst-Carrying Pipe Lines

REDUCE EXPENSIVE SHUTDOWNS

by using

Irving "GRIDSTEEL", the quality contour retainer mesh.

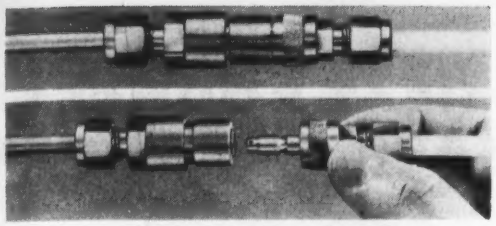
IRVING SUBWAY GRATING CO., INC.

ESTABLISHED 1902

OFFICES and PLANTS at

5050 27th St., Long Island City 1, N. Y.
1850 10th St., Oakland 10, California

When inquiring check CP 5579 opposite last page



Fittings are available in all metals

any leakage during connecting or disconnecting operation. Internal design allows free flow, and exteriors are slim and streamlined for convenience in handling. All fittings are assembled, finger-tight and ready for immediate use.

(Swagelok quick-connect fittings are a product of Crawford Fitting Co., Dept. CP, 884 E. 140th St., Cleveland 10, Ohio . . . or for more information check CP 5580 on form opposite last page.)

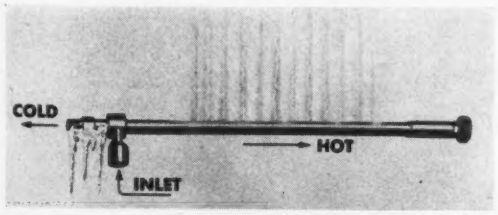
Produces sub-zero and 200°F temp by release of compressed air or other gas into tube . . .

no refrigerating mechanism or flames required

Uses: Source of heat without use of flame or electrical resistance, or as a temporary, convenient source of refrigeration.

Features: Tube produces sub-zero low temperatures at one end and high temperatures in excess of 200°F at the other by release of compressed air or other gas into tube. No refrigerating mechanism or flame is required.

Description: Unit consists of ⅜" diameter tube 17" in length. Air or other gas enters tangential entry nozzle near one end of tube producing a



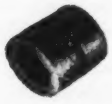
Temperature drop of 80°F below that of inlet air is possible

vortex in internal chamber. Longer arm of tube is heated while shorter section is cooled. Efficiency is low compared to standard refrigeration systems. Temperature drop of 80°F below that of inlet air is possible.

(Fisher Hilsch vortex tube is a product of Fisher Governor Co., Dept. CP, Marshalltown, Ia. . . . or for more information check CP 5581 on form opposite last page.)

IDENTIFICATION DISC: An aluminum marking plate on all Walworth No. 225P's facilitates inventory control and makes reordering quick and positive.

NEWLY DESIGNED HANDWHEEL: Patented air-cooled, finger-fit handwheel affords sure grip even with greasy gloves.



IMPROVED PACKING: Molded packing of lubricated asbestos reinforced with copper wire. Suitable for practically every service. Valves can be repacked under pressure when fully opened.

take a good look at the Walworth "500 Brinell" no. 225P Globe

– the Toughest Bronze Valve Your Money Can Buy

The stainless steel, corrosion resistant seats and discs are heat treated to a hardness of 500 Brinell – hard enough to scratch glass and crush nails! The valve can be closed on sand, slag, and pipe scale without injury to the seating surfaces. "Wire drawing" is practically eliminated. All parts are accurately machined and gaged. Years of tight, positive shut-off are assured.

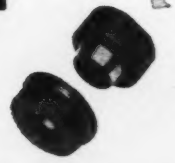
Available in both globe and angle types (angle type: No. **227P**) in sizes ¼" to 2", this quality valve is recommended for 350 lbs. W.S.P. at 550 F, and 1000 lbs. non-shock service on cold water, oil, gas, or air.

For full data on this long-life, economical Walworth Bronze Valve, see your local Walworth distributor, or write for Circular.

note these 7 Great Features

HEXAGONAL UNION BONNET CONNECTION: Union bonnet connection eliminates any chance of distortion or leakage even though valve is repeatedly taken apart and reassembled.

OVERSIZE STEM: The high-tensile strength silicon-bronze stem assures long life and protection against wear.



SEATS AND DISCS: Plug type seats and discs of stainless steel, heat-treated to 500 Brinell hardness and machined simultaneously to a mirror-like finish, with accurate tapers assures tight positive shut-off with minimum handwheel effort.

EXTRA STRONG BODY: Made of Composition M (ASTM B61) bronze. Thick walls and rugged hexes provide a high safety factor. Valves undergo hydrostatic shell test of 1,200 psi.

WALWORTH

valves and fittings

60 EAST 42nd STREET, NEW YORK 17, N. Y.

DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

When inquiring check CP 5582 opposite last page

ACCO products

R-P&C BRONZE VALVES—125, 150, 200 AND 300 LB. PRESSURE CLASSES

GATES

Fig. 86 illustrated, rated for 125 lbs., steam, 200 OWG, has stationary stem, solid wedge, screwed ends. Other 125 lb. models with screwed bonnet, rising stem, solid or split wedge.

GLOBES & ANGLES

Fig. 1A Globe illustrated, rated 150 lbs. steam, 300 OWG, has renewable asbestos disc, union bonnet. Also furnished as Angle. Sizes ⅛" to 3".

CHECKS

Fig. 198 illustrated, rated for 125 lbs. steam, 200 OWG. Other swing check valves in 150, 200, 300 lb. classes.

"Reliable Protection & Control"

FREE—
WALL CHART
"HOW TO SELECT VALVES"
Write for your copy

ACCO

R-P&C Valve Division
AMERICAN CHAIN & CABLE

Reading, Pa., Atlanta, Boston, Chicago, Denver, Detroit, Houston, New York, Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn.

Better Values

When inquiring check CP 5583 opposite last page

Accessibility of coils eases dehumidifier maintenance . . .

capacities are available from 2300 to 45,900 cfm

Uses: Central station dehumidification of air by sprayed coil system.

Features: Dehumidifier offers easier maintenance by providing complete accessibility of coils, spray nozzles, float valve, strainer, drain troughs, and tank.

Description: Units are available in standard arrangements with capacities from 2300 to 45,900 cfm. Arrangements are 1, 2, or 3 coils high and from 4 to 8 coil rows deep. Recirculated spray water requirements range from 5 gpm to 84 gpm depending on unit size. Two types of coils are available; one for use with chilled water, well water, or brine, the other for direct expanded refrigerants.

(Dehumidifiers are a product of American Blower Corp., Dept. CP, 8111 Tireman Ave., Detroit 32, Mich. . . . or for more information check CP 5584 on the convenient Reader Service slip which is located opposite last page.)

Reports on grating, stair tread

Dimensional sketches and data on riveted and electro-forged welded grating of steel, aluminum, and stainless are given in four-page folder. A detailed safe load table with conversion factors, panel width constant chart, and data on standard widths and type of steel stair treads are also recorded. Also discussed are bridge decking and various anchors suggested for grating installations.

Form 504-955 on grating and stair treads is available from Dept. SP, Klemp Metal Grating Corp., Dept. CP, 6601 S. Melvina Ave., Chicago 38, Ill. . . . or check CP 5585 on the convenient Reader Service slip which is located opposite last page.

HEAT BOUNCES BACK OFF ROOFS

protected by Tropical's

COOLERANT!

Bright, non-staining Coolerant, easily brushed or rolled on commercial or industrial roofs, deflects up to 70% of the sun's radiant heat. It reduces below-roof heat up to 26° — you can feel the difference AT ONCE! Reduces air-conditioning load. Prevents summer dry-out, adds years to roof life. Increases winter heating efficiency. Anyone can apply it.

FREE! Complete details sent at once. Beat the heat this summer with Coolerant. Write now!

TROPICAL PAINT COMPANY
1128-1274 W. 70th, Cleveland 2, O.

HEAVY-DUTY MAINTENANCE PAINTS SINCE 1863 • SUBSIDIARY OF PARKER RUST PROOF COMPANY

When inquiring check CP 5586 opposite last page

EMBECO PRE-MIXED GROUT
is *Ready to Use*

NON-SHRINK GROUTING of
Heavy Equipment • Machinery
Anchor Bolts • Building Columns • Etc.

Write For Free Grouting Guide

DIVISION OF AMERICAN-MARIETTA COMPANY
the MASTER BUILDERS co.
CLEVELAND 3, OHIO TORONTO 9, ONTARIO

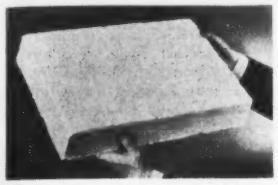
When inquiring check CP 5587 opposite last page

Greater compressive strength given ceramic fiber block for high-temp insulation

Uses: High-temperature insulation in applications up to 2300°F.

Features: Ceramic fiber block has improved handling and compressive strength, withstands flame impingement, and is unaffected by furnace atmospheres.

Description: Under ASTM test C-165, block deformation from a 4.47 psi load is 1%. An increase to 13.78 psi causes a deformation of 10%. Density is approximately 20 lb/cu ft. Thermal conductivity is 1.27 Btu/hr/sq ft/°F/in. at a mean temperature of 1000°F; at 2000°F it is 2.24. Linear shrinkage after 12 hr soak at at 1500°F is 0.21%; after 24 hr at 2300°F shrinkage is 3%. Standard sizes are 12 x 12", 18 x 12", 18 x 6", 36 x 6", and 36 x 12" in thicknesses ranging from 1½ to 4" in ½" increments.

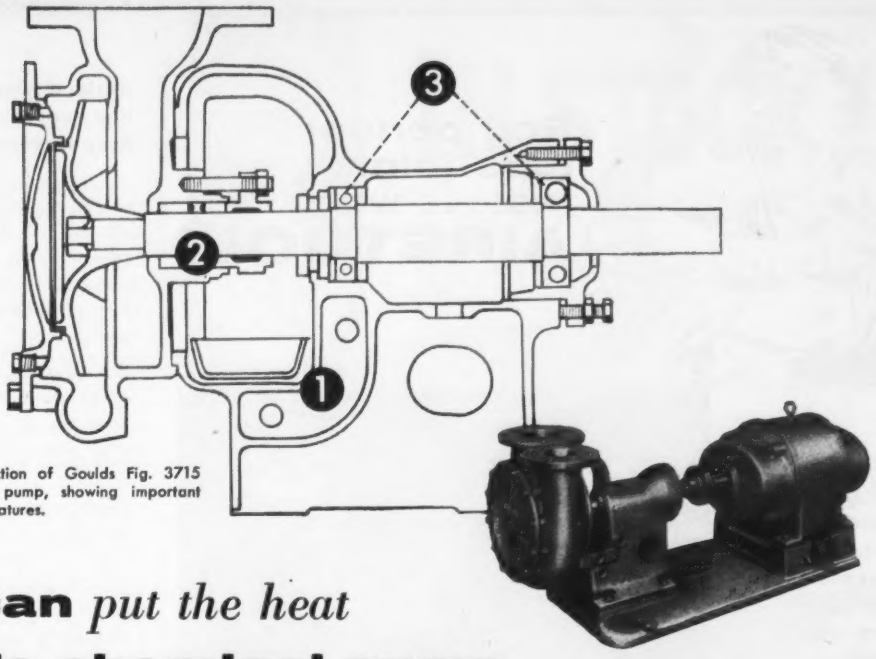


Ceramic fiber block withstands temperatures up to 2300°F

(F-20 Fiberfrax blocks are a product of The Carborundum Co., Dept. CP, Niagara Falls, N. Y. . . . or check CP 5588 opposite last page.)

"Dear Sirs: Concerning our recent adoption of your leak-proof pump packing. . ."

Thanks to W. K. Witherspoon, Building Supervisor at Du Pont in Louisville, Ky., for this cartoon idea.



Cross section of Goulds Fig. 3715 chemical pump, showing important design features.

You can *put the heat* on this chemical pump

Handling hot, corrosive, or abrasive liquids is what the Goulds Fig. 3715 pump is built for.

You can run this pump at 350° F. by cooling the support head (1) and quenching the gland, through fittings that are built in.

And you can get the pump in a variety of materials to meet your particular liquid-handling needs—type 316 stainless steel, Gould-A-Loy 20 (equivalent to ACI CN 7M CU), all bronze, bronze-fitted, all iron, or iron or bronze with stainless trim. These materials regularly stocked—other material can be furnished on order.

Wide range of sizes

There's a size, too, to meet most requirements—nine sizes in all, providing capacities up to 720 GPM, and heads to 200 ft.

Whatever size and construction material you need, you can be sure that your Goulds Fig. 3715 pump will operate with high efficiency and low maintenance cost.

Mechanical seals available

The stuffing box (2) is on the suction side of the impeller, subject to suction pressure only. Or we can equip your pump with either a single or double mechanical seal. Completely sealed bearings (3) keep out dirt and moisture, and are grease lubricated.

You can inspect and clean the interior of the pump, or remove and replace the impeller, without disturbing piping connections. You can adjust axial clearance between the impeller vanes and the casing by external means.

Interchangeability of parts

And you can keep your parts inventory low, for many of the parts are standardized for interchangeability between sizes. For example, you need only two different shafts for all 9 sizes of Fig. 3715 pumps.

We'd like to send you additional details about these chemical pumps. Just drop us a line, asking for Bulletin 725.4. It gives performance curves, sizes and specifications. Or, if you have a pumping problem of any kind one of our representatives will be glad to consult with you about it.

Goulds stainless steel pump handling corn meal mush in a food plant.

This Goulds chemical pump is handling hot fatty acids in an oil processing plant.

These three Goulds chemical pumps circulate hot size in a textile plant.

Goulds PUMPS INC. Seneca Falls New York

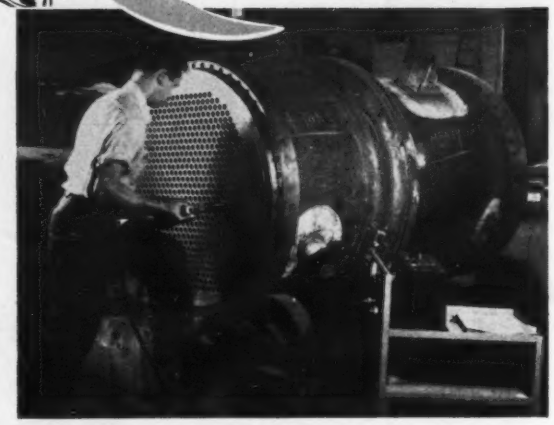
MEMBER

ATLANTA • BOSTON • CHICAGO • HOUSTON • NEW YORK • PHILADELPHIA • PITTSBURGH • TULSA

When inquiring check CP 5589 opposite last page

Roll perfect tube joints fast . . . with AIRETOOL!

So simple to operate, even the most inexperienced man can turn out perfect tube bundles, fast!



AIRETOOL'S new, electrically controlled automatic tube expansion control system makes it possible to roll perfectly bonded tube joints in half the time usually required by old manually controlled methods. With the AIRETOOL Expansion Control System, the ball bearing type expander is controlled by an electric motor regulated by the control system. When tubes have reached the proper expansion and tightness, the control mechanism automatically shuts off the power. Seven motors, covering every range of power needed, are available for use with the control. You simply set the calibrated dials for the type of metal and tube size, and you're ready to go to work. Can you afford to continue operations without these AIRETOOL advantages . . .

- Cuts Maintenance Cost
- Boosts production output
- Eliminates over-expansion
- Permits tubes to be rolled to maximum tightness without injury to tube ends or distortion to tube sheet ligaments
- Eliminates cold worked metal stresses in tubes
- Gives tight, leak-proof joints every time
- Cuts tube rolling failures to absolute minimum
- Completely portable

We'll be glad to give you an on-your-job demonstration. Contact your nearest AIRETOOL representative, or write, wire or phone the AIRETOOL Mfg. Co., 318 S. Center St., Springfield, Ohio. Also ask for full details and information on AIRETOOL tube maintenance equipment suited to your needs.

AIRETOOL
MANUFACTURING COMPANY
316 S. Center St.
SPRINGFIELD, OHIO

BRANCH OFFICES: New York, Chicago, Tulsa, Philadelphia, Houston, Baton Rouge.
REPRESENTATIVES in all principal cities of U.S.A., Canada, Mexico, South America, England, Europe, Puerto Rico, Italy, Japan, Hawaii.
EUROPEAN PLANT: Vlaardingen, The Netherlands

When inquiring check CP 5590 opposite last page

Braided wire walls and neoprene tube, hose features . . .

provide extra safety at 2000 psi, withstand hot oil

Uses: Transportation of air, water, or oil for air actuating service, pneumatic tools, and compressors.

Features: Hose has braided wire construction for extra safety at pressures to 2000 psi. Neoprene tube inner lining withstands hot oil.

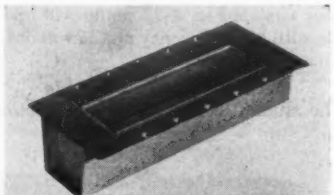
Description: Steel braids offer maximum resistance to accidental crushing. Hose is light and flexible enough for easy handling. Bright yellow cut-resistant cover provides maximum visibility — preventing accidental injury from other operating equipment.

(Super-Master BW air and water hose is product of Manhattan Rubber Div., Raybestos-Manhattan, Inc., Passaic, N.J. . . . or check CP 5591 opposite last page.)

Removes tramp iron from moving material . . .

design of non-electric magnet proved in use tests

Uses: Efficient removal of tramp iron and iron of abrasion from rapidly moving or entangled material burdens.



Magnet's design permits moving material to flow smoothly

Features: Actual use tests involving rapidly moving or entangled material resulted in present design of non-electric plate magnets for removing tramp iron.

Specify **KNOX** TOWER PACKINGS

PORCELAIN

Save Time and Money on

KNOX

Tower Packings

RASCHIG RING

- Uniform Quality
- Zero Porosity
- Iron Free
- High Strength
- Resists High Temperature, Fumes, Vapors, Corrosion, Alkalies and Acids
- KNOX produces porcelain Tower Packings from same composition as is used for High Voltage Electrical Porcelain

Your Inquiry Will Receive Prompt Attention

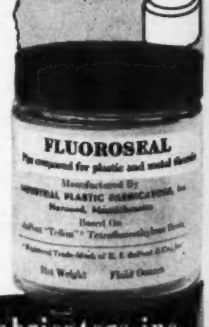
KNOX PORCELAIN CORP.
KNOXVILLE I, TENNESSEE

When inquiring check CP 5592 opposite last page

FLUOROSEAL
PIPE COMPOUND
Cuts Assemblies 80%

Says W.D. WELCH of the Artisan METAL PRODUCTS-ING WALTHAM, MASS.

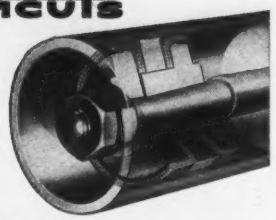
"We have been using Fluoroseal Pipe Compound for the last 2-1/2 years and we have found it to be without a doubt the best solution of its kind. As you know, stainless steel piping is a real problem and we have found out that the use of Fluoroseal has cut our time for piping assemblies as much as 80%."



MANUFACTURED BY
industrial plastic fabricators inc.
NORWOOD MASS. NOrwood 7-3411

When inquiring check CP 5593 opposite last page

KEEP EFFICIENCY HIGH with DARCOVA PUMCUPS



Pumcup designs include the conventional and 45° bevel types in a full range of sizes for all reciprocating pump and cylinder mechanism requirements.

A LOT of dollars go slipping right past the pistons of reciprocating pumps and cylinders that must be frequently repacked. But Darcova Pumcups keep pump efficiency *up*, hold slippage and maintenance *down!*

Because of Darcova's unique design, true texture engineering and precision manufacture, Pumcups outlast other packing at least 3 to 1.

Why not judge for yourself? Get all the facts. Send today for informative Bulletin No. 5503.

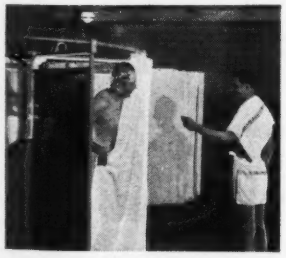
DARLING VALVE & MANUFACTURING CO.
Williamsport 4, Pa.

DARCOVA — the original composition cup

TRADE MARK PUMCUPS

When inquiring check CP 5594 opposite last page

Group Showers Save Bathing Time

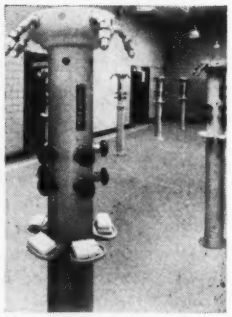


Because they save space and time, Bradley Group Showers have become industry's choice. *One* Shower Unit provides for 5- or 3-stalls with or without partitions and curtains.

One set of piping connections (hot and cold water, and drain) instead of five or three sets. This and the fact that Bradleys come partially assembled cut installation time and costs.

Above shows 3-stall Showers installed along wall and provided with stall partitions and curtains. At right is installation of Column Showers in chemical plant, each serving five bathers simultaneously, each with complete control of water temperature and flow.

For complete specification data, see pages 24 to 26 of new Catalog 5601. Copy mailed on request.



BRADLEY WASHFOUNTAIN CO.
2231 W. Michigan Street,
Milwaukee 1, Wisconsin

BRADLEY multi-stall showers

Write for copy of newCat a log 5601.

Distributed Through Plumbing Wholesalers

When inquiring check CP 5595 opposite last page

They can be used to remove iron from chemicals, plastics, liquids, and wet and dry solids of many kinds.

Description: Step face of unit permits moving material to flow smoothly. Attached iron is held firmly and cannot be forced from magnet surface by heavy or rapidly moving material. Line includes four basic types which differ in effective magnetic range from 2½" or under through 4". There are 35 standard sizes from 4 through 72" wide, available in each basic type.

(Perma-Plate magnets are products of Dings Magnetic Separator Co., Dept. CP, 4740 W. Electric Ave., Milwaukee 46, Wis. . . . or for more information check CP 5596 on form opposite last page.)

Shows commercial uses of Mylar film

Latest commercial uses and detailed physical and chemical properties of Mylar polyester films are shown in eight-page booklet. Photographs and charts detail applications in chemical and electrical industries.

Booklet MB-4 may be obtained from Film Department, E.I. du Pont de Nemours & Co., Dept. CP, Wilmington 98, Del. When inquiring specify CP 5597 on form which is located opposite last page.

Trouble-shooting chart for hydraulic systems

Tow-color, 12 x 18", wall chart tells what to do for common hydraulic system troubles. Chart outlines variety of troubles usually encountered, their cause, and probable solution.

Form A-3325 Trouble-shooting Chart is available from Industrial Products Dept., Sun Oil Co., Dept. CP, 1608 Walnut St., Philadelphia 3, Pa. When inquiring specify CP 5598 on form opposite last page.

prices start at **$98**

IN STOCK!

a low-cost, low-volume pump for corrosive liquids!

CHECK these Eco All-Chem pump features against your needs:

- **Capacities: 1-10 gpm at 1750 rpm, up to 150 psi.**
- **Metal housing: Type 20 or Type 316 stainless steels; Hastelloy C.**
- **Impellers: Teflon, Neoprene, Formica.**
- **Flow characteristics: linear non-surging, non-foaming, non-aerating . . . lowest corrosion rate in pump and accessory piping.**
- **Positive displacement . . . high suction lift . . . self-priming with non-volatile liquids . . . operates in either direction.**
- **Drives: Direct motor, V-belt or vari-speed pulley drive.**
- **Standard parts mass produced and stocked for immediate shipment and for complete interchangeability.**
- **Adaptable for constant volume transfer, for agitating and pumping shear-sensitive fluids under pressure, and for constant flow metering.**
- **Handles organic, inorganic, hazardous and radioactive fluids.**
- **Lowest price in its class . . . the most pump and pump performance for your money.**

Write for Bulletin AC56

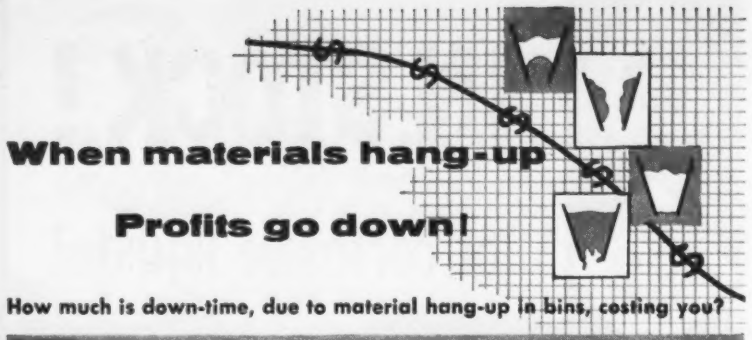
All-Chem® PUMPS

Look to ECO for low cost, high quality, corrosion resistant rotary and centrifugal pumps.

ECO
ENGINEERING COMPANY
the big name in small pumps

12 NEW YORK AVE. • NEWARK 1, N. J.

When inquiring check CP 5599 opposite last page



When materials hang-up

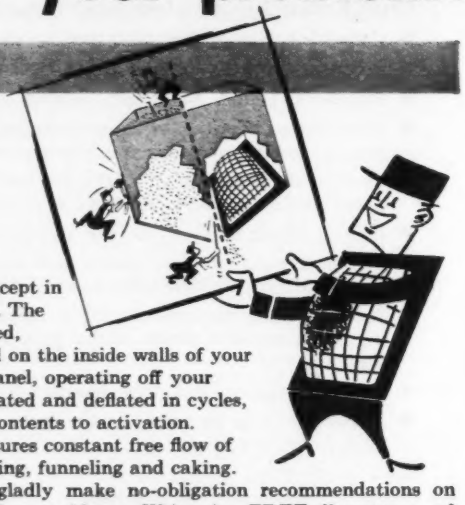
Profits go down!

How much is down-time, due to material hang-up in bins, costing you?

If you have a problem of material flow from your bins, your entire production line is bound to suffer.

PneuBin

can solve your problem!



- Safe
- Economical
- Quiet

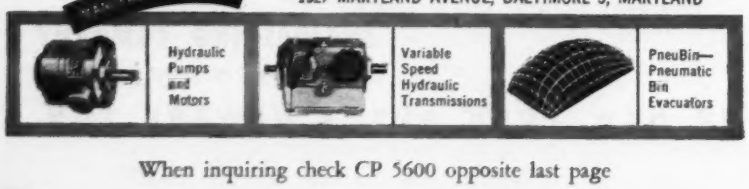
PneuBin panels are a new concept in bin-stored material activation. The PneuBin panel is a steel-backed, Neoprene diaphragm mounted on the inside walls of your present bins. This PneuBin panel, operating off your regular plant air supply is inflated and deflated in cycles, positively displacing the bin contents to activation. This positive displacement assures constant free flow of materials . . . eliminates bridging, funneling and caking.

PneuBin engineers will gladly make no-obligation recommendations on your specific material handling problems. Write for FREE literature and *"Flow Stoppage Report."*

GEROTOR

MAY CORPORATION

1527 MARYLAND AVENUE, BALTIMORE 3, MARYLAND



When inquiring check CP 5600 opposite last page

engineering and maintenance

Merck assures sterile conditions

. . . with 300 lubricated plug valves

Design prevents collection of solid matter and possible process contamination in fermentation lines of antibiotic plant

Problem: When Merck & Co., Inc., Chemical Division, specified equipment for their Cherokee antibiotics plant at Danville, Pa., in 1951, choice of valves was of particular importance. Production fermentation for antibiotic manufacture requires sterile conditions in processing lines and equipment. Valves' design needed to be such that they would not act as pockets to collect solid matter from process streams. In some cases lines would be used for various materials at different times. Solids remaining in a valve from one operation could seriously contaminate batches being processed at a later date. Even though products involved were similar, contamination could occur.

Because batch operations required periodic valving, rapid, easy valve opening and closure would be necessary. Closure must be tight to permit complete isolation of any one or group of fermenters from other tanks served by same headers. Valves used infrequently must not become inoperative, causing delays in production.

Solution: Over 300 carbon steel lubricated plug vales were specified for service on all critical lines and equipment. Valves range from 1 to 3″; are three-way, two-port, with a single L-shaped

One-quarter turn of valve plug gives complete, sure closure

Pressure lubrication provides a positive means of freeing valve for operation

passage connecting any two ports, or three-way, three-port, with any of three ports connected by a T-shaped opening.

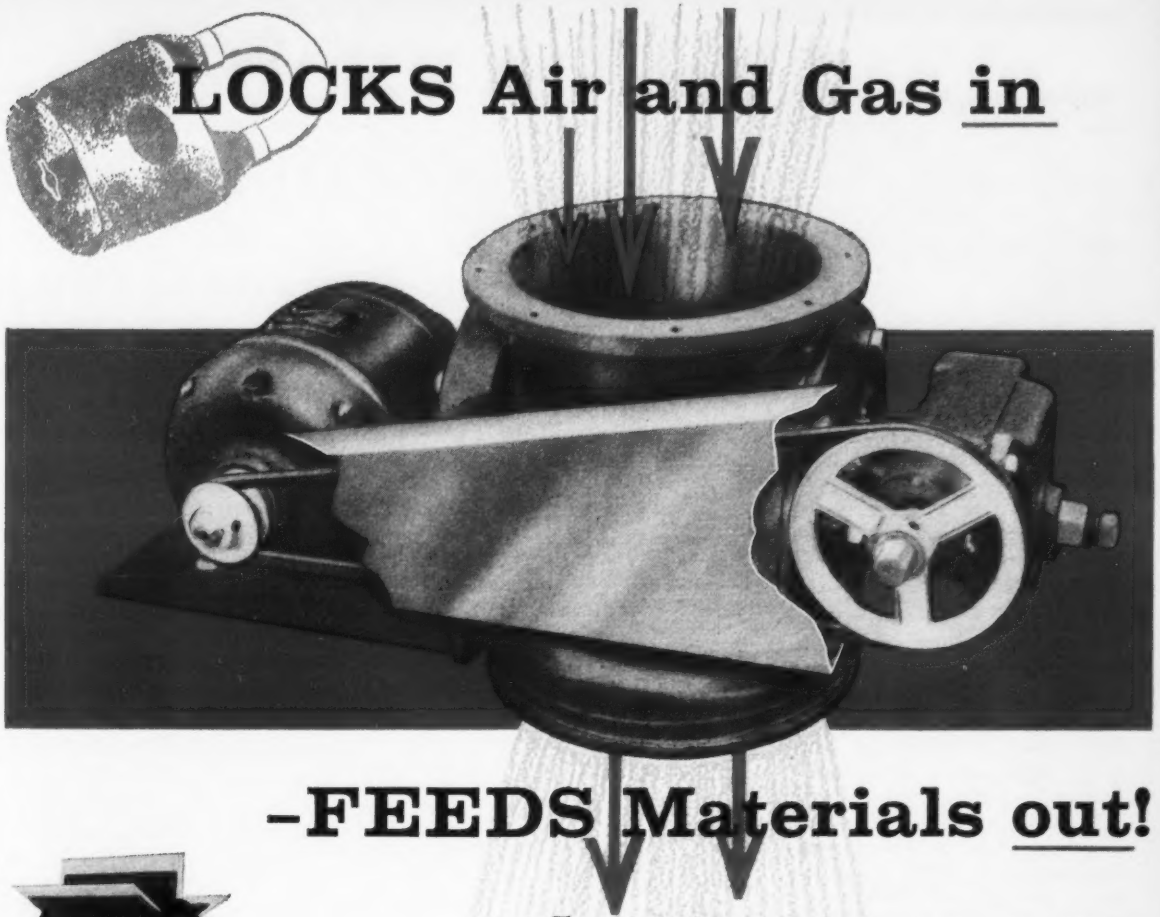
Pressure lubrication serves three functions: 1) It provides a jacking action against smaller end of plug, causing momentary unseating which allows immediate operation regardless of how long valve has been unused. 2) An effective seal is formed to prevent any leakage. 3) Friction and wear are reduced to a minimum.

Lubrication procedure is simple. Gun, loaded with high temperature lubricant formulated for particular service involved, is used to force lubricant into valve until a pressure gage on gun indicates lubrication is complete.

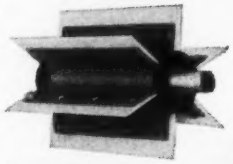
Results: Basic plug valve design combines tight fit of wedge action with sliding action of rotary movement. Closure is complete, sure, and requires only one-quarter turn. Since plug opening is only passage available to liquid flow, and rotary motion on closing wipes plug face clean, it is not possible for solids to become wedged in valve body and cause contamination. Pressure lubrication assures that sticking will not occur by providing a positive means of unseating valve.

Plug valves have maintained an excellent operational record. Many have been in continuous service since plant began operation four years ago.

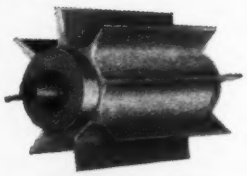
(Lubricated plug valves are a product of Nordstrom Valve Div., Rockwell Manufacturing Co., Dept. CP, 398 N. Lexington Ave., Pittsburgh 8, Pa. . . . or for more information check CP 5601 opp. last page.)



LOCKS Air and Gas in –FEEDS Materials out!

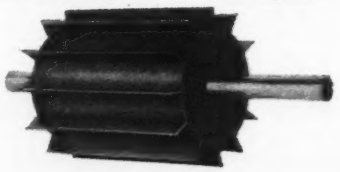


6-VANE ROTOR
with plastic, rubber, or other replaceable vanes.



12-VANE ROTOR
designed for use as a feeder, furnished with carbon steel cylinder and brass blades. Other metals available.

SOLID 8-VANE ROTOR
furnished in cast iron, bronze, stainless steel, monel, etc.



The MIKRO Rotary Airlock provides an ideal method of feeding free-flowing materials under pressure or vacuum, while sealing in air or gas from passing on with the material.

A precision-built rotary valve, the MIKRO Airlock continuously feeds materials from an upper chamber into a lower one by gravity. The vanes of its rotor provide a seal which prevents leakage of air or gas from the upper chamber into the lower chamber, or into the atmosphere.

Applications of the MIKRO Rotary Airlock are many and extremely varied. It can be used at the discharge of a pulverizer or a dust collector. It can also be used on the discharge of a blender or mixer to regulate the flow of material from the unit. It can likewise be used as a feeder to control the rate of flow from a storage bin or hopper, or as a feeding mechanism to a pulverizer, a pneumatic conveying system, mixer or blender.

The MIKRO Airlock is available for low or high pressure use, with capacities varying from 100 to 15,000 lbs. per hour depending upon rotor speed and density of material handled. Furnished with various types of rotors and vanes to meet specific requirements.

SEND FOR new MIKRO Rotary Airlock Bulletin

Mikro-D

PULVERIZING MACHINERY DIVISION
METALS DISINTEGRATING COMPANY, INC.
60 CHATHAM ROAD **SUMMIT, NEW JERSEY**

PULVERIZING • AIR CONVEYING • DUST COLLECTING EQUIPMENT

When inquiring check CP 5602 opposite last page

Leakless pump lines now available . . .

utilize canned motor principle with interchangeable parts

Uses: Pumping precious or hazardous liquids where no leakage is permitted.

Features: Two lines of leakless, general-purpose, centrifugal pumps have been added to company's products. Units utilize canned motor principle in which all rotating elements of pump and motor are contained in a thin wall cylinder making an absolutely leakproof unit. For any given rotor diameter there is interchangeability of parts which will help stocking by large volume users.

Description: Pumps are available in fractional horsepower sizes through 2 hp (C-10), and integral horsepower group (C-11A with fluid piston radial bearings and C-11B with carbon sleeve radial bearings) covering motors above 2 hp. Units are capable of accommodating heads to 250 ft and temperatures to 250°F. Capacities up to 500 gpm are available.

(Canned motor pumps C-10, C-11A, and C-11B are products of Allis-Chalmers Manufacturing Co., Dept. CP, 1151 S. 70th St., Milwaukee 1, Wis. . . . or for more information check CP 5603 on form opposite last page.)

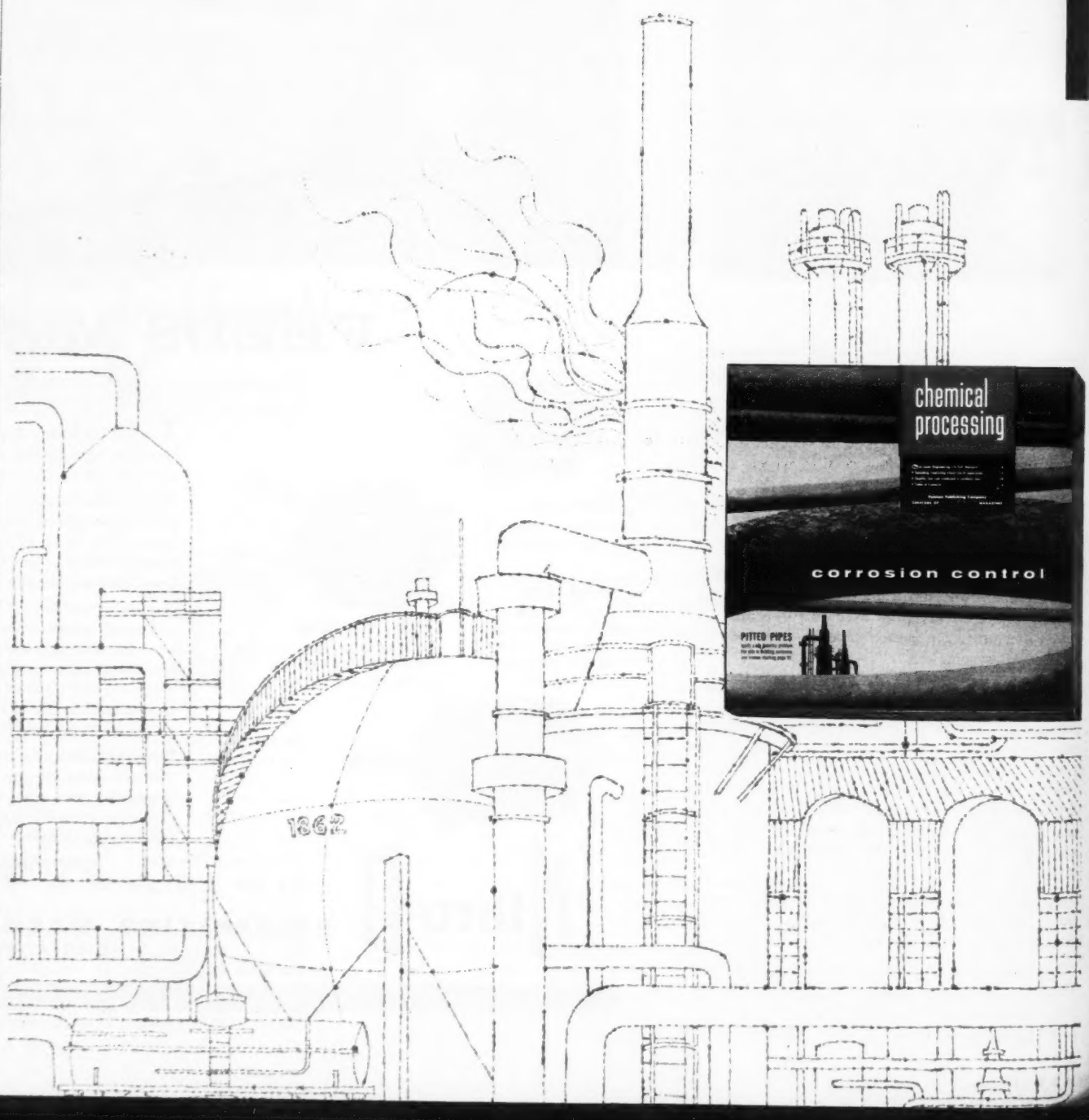
Prototype of standard design of water tube boilers built for Navy . . .

will set standard for factory-assembled units

Uses: Production of steam for heating, utilizing either coal, oil, or gas.

Features: Packaged boiler unit was built as a prototype to set standards for factory-assembled units in capacities ranging from 10,000 to 25,000 lb of steam per hour. Since Navy requirements are essentially those of private industry, economies in design and fabrication of standardized units can be expected to aid other prospective users.

for these rapidly-expanding Chemical Processing Industries . . .



45,000 is Chemical Processing's circulation "enough" for "complete coverage"?

Frankly no!

CHEMICAL PROCESSING's recently-announced 45,000 circulation is *not enough* to match the terrific growth of the chemical processing industries . . . not enough to give advertisers penetration and near-saturation of these gigantic industries.

–for today, the annual value of chemical processing products is more than $60,000,000,000 (60 billions)

–that's one-sixth (1/6) of the nation's entire output of all lines

–and the chemical processing industries are growing at a rate of 9% per year – while all industry averages only 3% growth per year

Imagine, if you will, 2,500,000 to 3,000,000 employees engaged in chemical processing

How many key management executives in production does that mean? Conservative estimates place the figure at 200,000 to 400,000.

Then how much circulation should a chemical magazine have?

That's the $64,000 question.

We do know, however, that *no magazine*—and *no combination of magazines*—gives anything like complete coverage or near-saturation.

But CHEMICAL PROCESSING's 45,000 circulation gives more *real industry* coverage than any other publication serving the industry. However, when you compare, be certain to check *industry circulation*—i.e., real management operating executives, technical directors, etc.

Don't be misled by the quantities of "students," "foreign sales agents," and other non-industrial circulation of little or no buying power, which are so often accepted by some magazines as "filler" to build up circulation numbers.

Why doesn't CHEMICAL PROCESSING give more circulation?

There has long been much "loose" talk about "complete coverage" of the chemical processing industries (even with 10,000, 12,000 or 20,000) that advertising buyers have been misled. They have not realized how much of the tremendous buying power of these chemical processing industries they are missing.

But advertisers are becoming more and more aware. And as fast as buyers are ready to *use* (and pay for) more effective, near-saturation circulation, CHEMICAL PROCESSING will be ready to offer 60,000 . . . or perhaps 80,000 . . . or perhaps 100,000 *industry circulation.*

And all will be qualified buying power, key management production circulation—hand-picked as CHEMICAL PROCESSING circulation has always been.

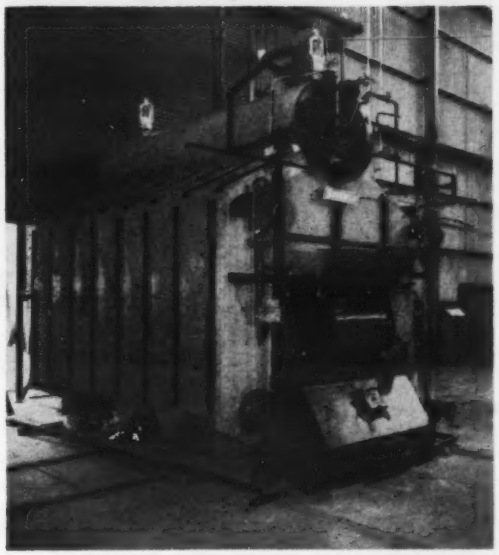
When will you be ready for 60,000?...or 80,000?...or even 100,000 industry circulation in these gigantic chemical processing industries?

Putman Publishing Company

Putman Publishing Building • 111 East Delaware Place • Chicago 11, Illinois

Publishers of: Chemical Processing/Food Processing / Food Business

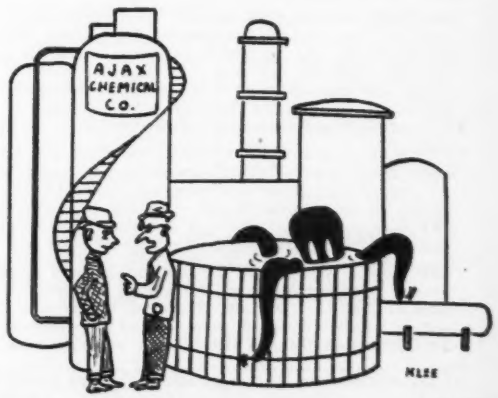
"EXECUTIVE MAGAZINES FOR INDUSTRY" BPA NBP



Boiler can utilize coal, oil, or gas as fuel

Description: Prototype already constructed has capacity of 12,500 lb of steam per hour and is designed primarily for coal firing but can be converted to utilize oil or gas in less than 60 hours. Unit is supplied with complete control panel, including piping and wiring necessary for fully automatic firing. Tube arrangement is of basic "A" type. Stoker equipment is continuous discharge, vibrating grate style.

(Prototype boiler was manufactured by Superior Combustion Industries, Inc., Dept. CP, 1475 Broadway, N.Y. 36, N.Y. Check CP 5604 opp. last page.)

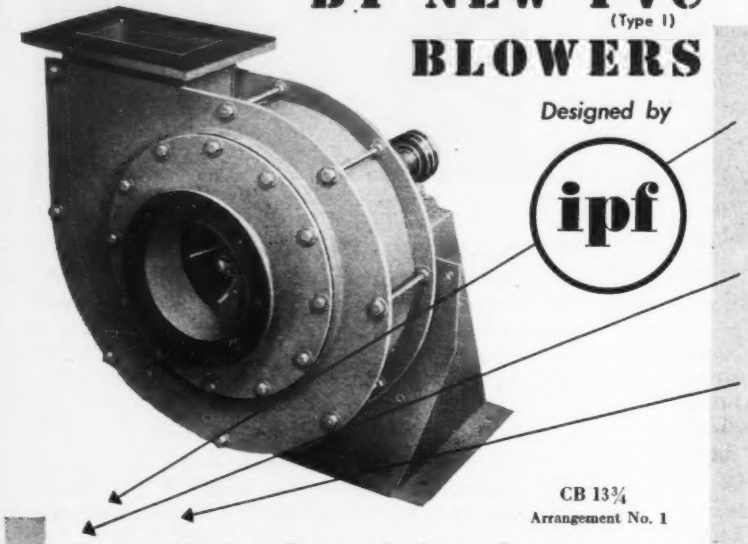


"This magnesium from sea water project has hit a few snags."

Cartoonist Albert J. Klee is with the Chemical Department of National Lead Company of Ohio, Cincinnati.

OUTMODED BY NEW PVC (Type I) BLOWERS

Designed by ipf



CB 13¾
Arrangement No. 1

If your problem is expelling corrosive fumes and gases, you need IPF Blowers. Ordinary blowers are susceptible to attack by these fumes and gases. Coating the blower is costly — and not foolproof. Maintenance and replacement costs are high . . . and valuable time is lost. Result — an expelling operation that eats into profits.

For trouble-free, long-life blowers, specify **IPF** blowers made of Unplasticized, Rigid Polyvinyl Chloride (UPPVC). UPPVC — the new construction material — exhibits inherent anti-corrosive qualities that allows **IPF** Blowers to withstand most chemical fumes and gases from 40°F to 140°F. Actual installations of **IPF** Blowers have lasted three times the normal life of ordinary blowers . . . and continue to function efficiently.

UPPVC is a lightweight . . . smooth surfaced . . . nonporous material of construction. Lightweight construction means greater capacity per B.H.P. . . . easier installation . . . reduced handling problems. Smooth, nonporous finish never require painting or maintenance expense. **IPF** Blowers are not subject to unbalance from chipping of a protective coating . . . because there is no coating. It's solid UPPVC.

IPF Blowers made of UPPVC are available in standard sizes that provide displacements from 143 C.F.M. to 7722 C.F.M. Standard wheel sizes of 9½, 13¾, 19, and 27 inches. Other sizes and capacities can be custom designed to fit special requirements. Full details on the new **IPF** Blowers available upon request.

Full details on the new IPF Blowers available on request.

MANUFACTURED BY
industrial plastic fabricators, inc.
NORWOOD, MASS. NOrwood 7-3411

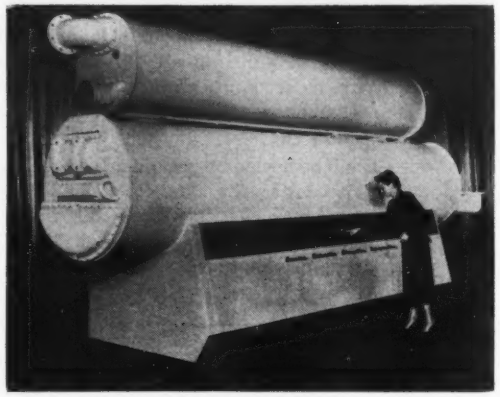
When inquiring check CP 5605 opposite last page

Chilled water from steam in 100 to 700 ton range with pushbutton ease . . .

packaged unit can be simply, quickly installed where cooling is required

Uses: Unit provides chilled water for use in air conditioning and process cooling system.

Features: Packaged absorption refrigerating machine produces chilled water from steam, hot water, oil, or any hot fluid. Cooler can be manually operated with simple stop-start pushbutton, time clock,



Water cooling unit has a capacity of 350 tons. It is operated by simple pushbutton

or thermostat. It will adjust automatically from full capacity to zero load. Design eliminates many major service lines and external auxiliary piping, reducing time and cost of installation.

Description: Units are available in a full line of eleven sizes ranging from 100 to 700 tons. Minimum number of moving parts and light weight makes machine suitable for installation on rooftops or on steelwork of industrial plants close to process where cooling is required.

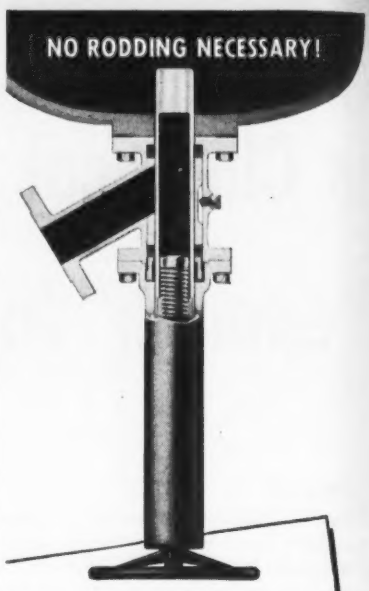
(Absorption refrigerating machines are products of Carrier Corporation, Dept. CP, 300 S. Geddes St., Syracuse 1, N. Y. Check CP 5606 opp. last page.)

Coupling's construction detailed

Quick connect-disconnect hose coupling's construction is clearly illustrated in page-size cut-away view in 20-page revised catalog. Also described and illustrated are single and double-check valve modifications of coupling. Safe operating pressures, coupling's specifications, and list of accessories are included.

"Quick-Seal Couplings" is available from Titeflex, Inc., Dept. CP, 10 Hendee St., Springfield 4, Mass. Specify CP 5607 opposite last page.

NO RODDING NECESSARY!



Strahman
RAM TYPE
Drain Valves

The Only Drain Valve That Cannot Clog Up!

In the closed position the piston or ram extends up into the tank, preventing plugging of the outlet.

In the open position with piston fully retracted, there is no resistance to flow of materials drained from the tank.

Made in any cast metal to meet your requirements.

Designed for bolting to existing flanges. For special adaptations and for jacketed vessels, adaptor pads are available.

Full Specifications on Application

STRAHMAN VALVES, INC.
16 Hudson Street
New York 13, U. S. A.

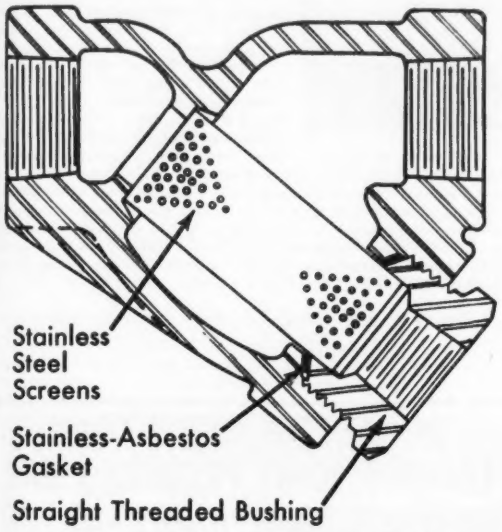
When inquiring check CP 5608 opposite last page

Stainless-asbestos gasket eliminates blowout in pipe strainer . . .

units are suitable for pressures to 900 psi and temperatures to 900°F

Uses: Pipe strainers for oil, gas, air, water, and steam lines.

Features: Stainless-asbestos gasket, locked between body and base of bushing in Y-type pipe strainer, eliminates chance of blowout. Units handle maximum pressure at 100°F of 1800 psig. They are suitable for pressures to 900 psi, temps to 900°F.



Screens are standard 0.045" diameter holes, 266/sq in or 24 x 110 wire mesh

Description: Strainers are available in ½ through 2" sizes, either screwed or socket weld. Sizes 1¼, 1½, and 2" have bolted retainer plates. Stainless steel screens are standard, either 0.045" diameter holes, 226/sq in or 24 x 110 wire mesh.

(Pipe strainers are a product of Armstrong Machine Works, Dept. CP, Three Rivers, Mich. . . . or for more information check CP 5609 opp. last page.)

Expansion joints — what, how to order

Complete specifications and a discussion of applications are used in 24-page catalog to outline what and how to order in company's line of expansion joints. Materials and methods of construction are included.

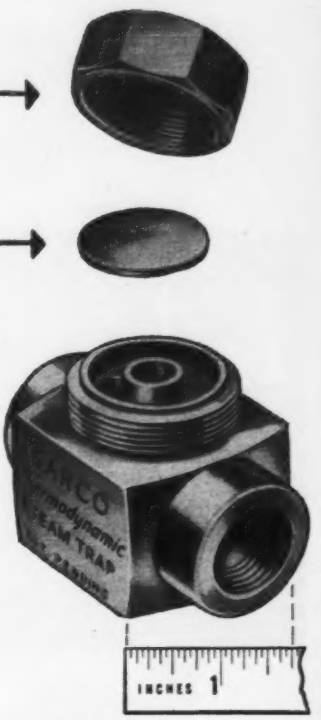
Cat 53 is available from Cook Electric Company, Dept. CP, 2700 N. Southport Ave., Chicago 14, Ill. Specify CP 5610 opposite last page.

Now — A Revolutionary NEW Steam Trap!

What could be simpler?

1. A CAP
2. A DISC
3. A BODY

That's all!



Practically Eliminates Maintenance!

Look at this revolutionary new thermodynamic steam trap. Could it possibly be simpler? Look for the valve closing mechanism—there isn't any! The kinetic energy of steam closes the valve and *only* the TD uses this new operating principle.

Only 3 parts . . . cap, disc and body . . . machined from stainless steel bar stock . . . all extremely simple, rugged, durable. Only one moving part . . . a hardened SOLID stainless steel disc . . . practically wear-proof.

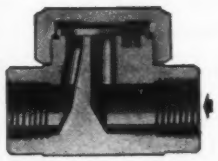
Just imagine how much time and expense this new TD steam trap can save you by greatly reducing and simplifying trap maintenance and inventory!

SOME OF MANY OTHER ADVANTAGES:

1. Use the same trap for 10-600 psi . . . for light or heavy loads . . . without seat or valve change or other adjustments.
2. Closes tight on no load — no steam waste.
3. Operates against back pressures up to 50% of inlet pressure.
4. Not affected by superheat, water-hammer, corrosive condensate.
5. Only one spare part—solid stainless steel disc.

TROUBLE-FREE DESIGN

No valve-closing mechanism to wear or stick—the kinetic energy of steam closes the valve. No critical clearances to choke. No gaskets to leak. Only one moving part—a SOLID stainless steel disc.



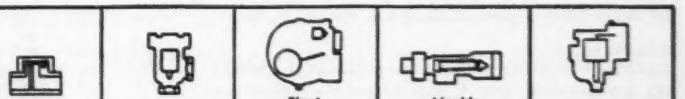
Ask for a 60 day trial installation of Sarco TD trap and strainer . . . write for bulletin 257. Sarco Co., Inc., Empire State Bldg., New York 1, N. Y.

SARCO

2148-B

Only Sarco Makes All 5 Types

That's why Sarco can give impartial advice on proper steam trap selection.



When inquiring check CP 5611 opposite last page

Look
WHAT YOU CAN DO
Now WITH
LIQUID METERS!

1. Improve Quality Control

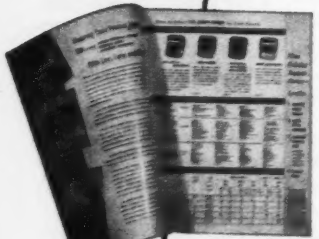
WITH METER-PRINTED BATCH TICKETS

This Neptune Print-O-Meter automatically stamps a ticket with the number of gallons or pounds of liquid delivered to your batch or process . . . a perfect, fool-proof record for closer control over quality, costs, and inventory. Coupled with Neptune Auto-Stop or Auto-Switch features, it offers you many new time and labor savings. The Print-O-Meter is available with accurate Neptune meters from 1 to 4 in. size, 5 gpm. to 500 gpm.

2. Control Pumps, Valves, etc.

WITH AUTO-SWITCH METERS

An explosion-proof electrical switch on this meter is actuated automatically when the desired quantity of liquid has been delivered. Use it to turn pumps on or off, to actuate solenoid valves, start agitators, or control other cycling operations. Available with or without the mechanically coupled Auto-Stop valve, which also is actuated by the tripping mechanism in the register. Auto-Switch available with Neptune meters from 1 to 4 in. size, 5 gpm. to 500 gpm.



Ask for Helpful Metering Bulletin 567AP

Lists more than 150 liquids . . . chemicals, syrups, hot and cold water, oils, etc. . . . you can measure faster, more accurately, more automatically with Neptune disc-type liquid meters.

NEPTUNE METER COMPANY
19 West 50th Street, New York 20, N. Y.

Branches in:
ATLANTA • BOSTON • CHICAGO • DALLAS • DENVER
NO. KANSAS CITY, MO. • LOS ANGELES • LOUISVILLE
PORTLAND, ORE. • SAN FRANCISCO

In Canada: NEPTUNE METERS LTD., TORONTO 14, ONTARIO

When inquiring check CP 5612 opposite last page

ENGINEERING

Two-stage vacuum pumps told of in brochure

Applications, materials of construction, and operation of two-stage steam jet vacuum pumps are told of in 12-page illustrated bulletin. Photographs of actual installations and three-color line drawings of features are included. Performance characteristics, sizing data, sizes and dimensions, are given in tabular form.

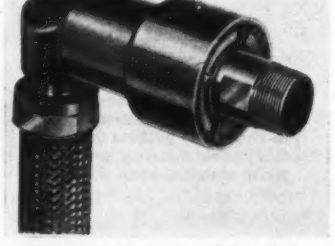
Units described include: condensing vacuum pumps with barometric intercondenser; special low-level arrangement of a direct contact condenser; condensing vacuum pumps with surface condensers; and non-condensing vacuum pumps.

Bul 5H2 is available from Schutte and Koerting Co., Dept. CP, Cornwells Heights, Bucks Co., Pa. When inquiring specify CP 5613 on form which is located opposite last page.

Leakproof performance assured rotary joint by ball bearings . . .

units prevent wobbling of shaft or misalignment

Uses: Conveying liquids or gases from a stationary pipe outlet to a revolving cylinder, drum, calender, or similar processing equipment.



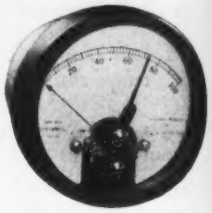
Rotary joints are available from 3/8 to 2"

Features: Two ball bearings support and guide rotating shaft of rotary joint preventing misalignment and wobbling to assure leakproof performance.

NEW METER-RELAYS FROM 0-5 MICROAMPERES - UP

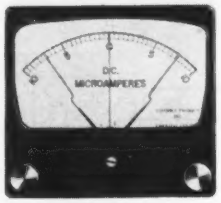
Ruggedized-Sealed—Black Bakelite—Clear Plastic Cases

D'Arsonval indicating meters with built-in locking contacts for sensitive and accurate control or alarm



TRIP POINT ADJUSTABLE to any point of scale arc. Sensitive to changes as little as 1%. One contact carried on moving pointer. The other on an adjustable pointer. When two pointers meet, contacts close and lock. Holding coil is wound directly over moving coil, locking action is electro-magnetic. Reset can be manual or automatic. Spring action in contacts kicks them apart forcefully.

Model 255-C, Single Contact, High Limit, 0-10 Volts DC $42.50



Model 461-C, Double Contact 10-0-10 Microamps DC $83.25

Ranges from 0-5 microamperes or 0-5 millivolts up, full scale. Temperature ranges from 0-300°F. (10 ohms external) have bimetal cold junction compensation. **Standard Contact Rating** 5 to 25 milliamperes DC. Can be built up to 100 milliamperes DC.

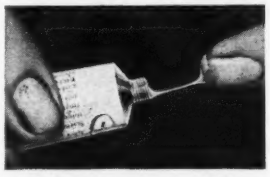
Ruggedized-Sealed metal cases are 2½", 3½" and 4½" round, shock-mounted, gasket-sealed.

Black Bakelite case, 4½" rectangular. **Clear Plastic cases** are 2½", 3¾", and 4½" rectangular. Maximum visibility and lower cost.

Panel meters and indicating pyrometers are also available in ruggedized-sealed, black bakelite or clear plastic cases. New 40-page catalog lists prices and specifications for meter-relays, meters, pyrometers and automatic controls using meter-relays. Write for Catalog 4-A, **Assembly Products Inc., Chesterland 36, Ohio.** HAmilton 3-4436 (West Coast: Desert Hot Springs 25, Calif. **Phone:** 4-2468).

When inquiring check CP 5614 opposite last page

NO MATTER WHAT YOUR LEAKING JOINT PROBLEMS ARE



Leak Lock clings in tough films that stretch rather than break

IT MAY PAY YOU TO TRY LEAK LOCK LIKE OTHER MAINTENANCE MEN HAVE DONE

For 5 years, Leak Lock has been surprising skeptical people who didn't expect to find a "barrier" for an "impossible-to-hold" material. They were surprised at the broad scope of its capabilities.

Leak Lock is being ordered regularly by a well-diversified list of important concerns who regard it as a "find" for special uses.

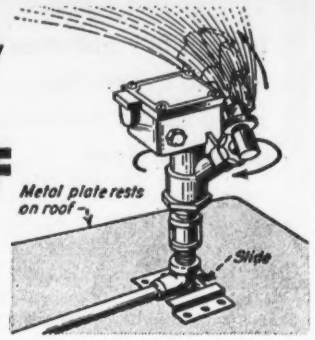
Send for information and a sample. And here's a tip: Don't depend on a lab. test. Try it on the actual job, and then you will know.

Leak Lock

STEWART INDUSTRIES, INC.
(FORMERLY HIGHSIDE CHEMICALS CO.)
16 COLFAX AVENUE CLIFTON, N. J.

When inquiring check CP 5615 opposite last page

COOL any building from the ROOF effectively efficiently economically



ROOF COOLING dispels summer heat by evaporating a thin film of water that is constantly renewed **at negligible cost.**

Quickly and easily installed it immediately brings comfortable working conditions to your plant. Write for literature and details mentioning your roof dimensions.

RUPPRIGHT'S ROTARY ROOF COOLER

Box 6795cp **Los Angeles 22, Calif.**

When inquiring check CP 5616 opposite last page

REPUBLIC
VALVES
INDUSTRIAL • CHEMICAL • AIRCRAFT

J.I.C. AND AN STANDARD TUBE ENDS

Skilfully engineered 2, 3, and 4-way Plug Valves are built by Republic in brass and aluminum alloy, sizes ⅛" to 1". Hydraulic Relief Valves opening at pressures up to 450 psi made in brass, aluminum alloy, steel, and stainless steel, sizes ⅛" to ¾". Pipe, AN or J.I.C. tube ends, or combinations.

Also manufacturers of high quality globe, needle, low and hy-pressure check valves, and special valves to specifications.

Write for complete catalog and name of nearest distributor.

RM REPUBLIC MANUFACTURING CO.
15655 BROOKPARK ROAD • CLEVELAND 11 OHIO

When inquiring check CP 5617 opposite last page

Description: Units have exterior screw adjustment, floating rotary seal, and pressure equalizing chamber. They are available in standard sizes from ⅜ to 2" IPS in both syphon and single-flow types. Joints are provided with a tamperproof metal seal which is dated so that length of service can be readily determined.

(PR 25 rotary joints are a product of Seamlex Co., Inc., Dept. CP, 41-23 24th St., Long Island City 1, N.Y. . . . or for more information check CP 5618 on form opposite last page.)

Convolute diaphragms have heat and oil resistance . . .

units are suitable for temperatures up to 300°F

Uses: As opening diaphragms in hydraulic or pneumatic controls or valves located in hot areas.

Features: Convolute diaphragms are custom molded from nitrile rubber for applications involving temperatures up to 300°F. They are oil-resistant.

Convolute diaphragms are suitable for working pressures up to 100 psi

Description: Units are molded with a single ply of high-tensile fabric and require less operating power. Most sizes are suitable for working pressures up to 100 psi. They are available in sizes up to 30" diameter.

(Convolute diaphragms are a product of Molded Rubber Div., Stowe-Woodward, Inc., Dept. CP, Newton Upper Falls 64, Mass. . . . or for more information check CP 5619 opp. last page.)

Here's How to Handle Corrosives at High Peripheral Speeds

CHEMLON YARN PACKING STYLE C-30 Made of TEFLON* FIBER BY "JOHN CRANE"

Chemlon Yarn Style C-30 extra tough packing gives you two important advantages not provided by other types of braided or molded Teflon packing: 1) positive sealing efficiency at high peripheral speeds; 2) cooler running stuffing box under severe service conditions.

Style C-30 can be used to handle the most destructive acids, alkalis or solvents. The excellent thermal properties of Teflon, combined with the softness, resiliency and fluid retentive properties of fine fiber construction, adapt it to high temperature conditions to +300°F. The packing is made firm and dense by means of a special process which eliminates *large* voids.

HERE'S PERFORMANCE PROOF:—Fluid handled: 45% H_2SO_4 (impure) at 170°F.—Operating conditions: 1¼" pump shaft at 1700 rpm. or 555 fpm. peripheral speed. Results: 46 days good service. Previous best service record 7 to 10 days.

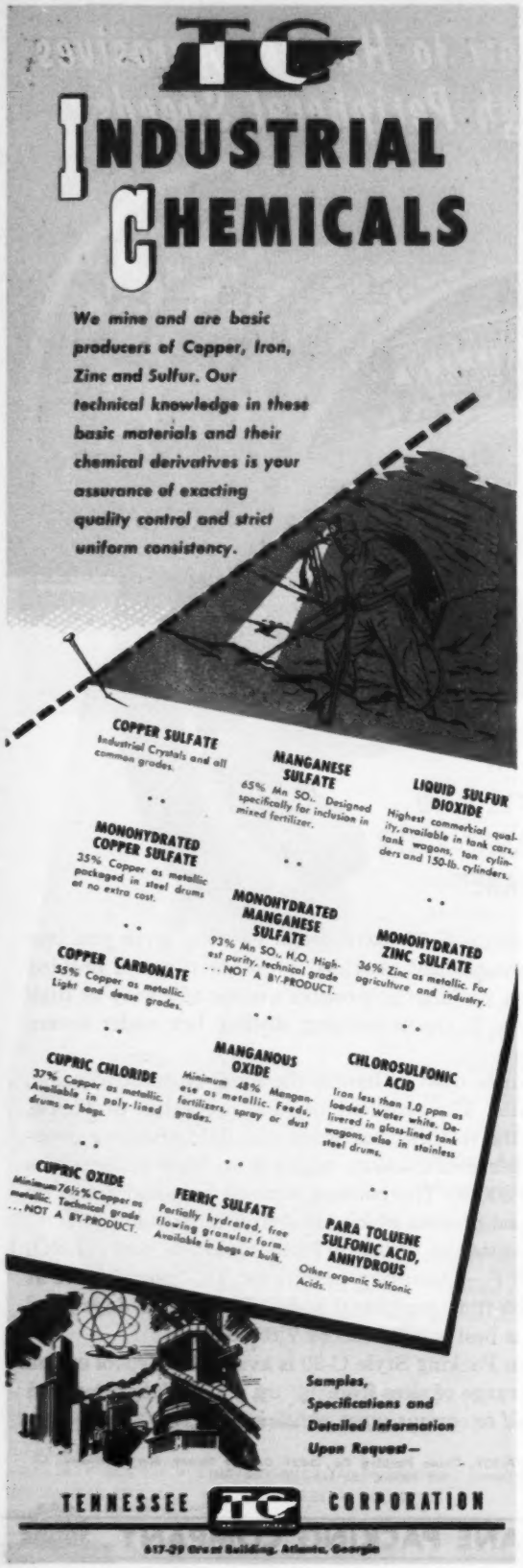
Chemlon Yarn Packing Style C-30 is available in spool or coil form, in a wide range of sizes from ⅛" up. *Can be lubricated with Teflon suspensoid or various types of lubricants.*

Send for Bulletin No. P-321. Crane Packing Co., 6421 Oakton Street, Morton Grove, Ill. (Chicago Suburb). In Canada: Crane Packing Co., Ltd., Hamilton, Ont.

*DuPont Trademark

JOHN CRANE **CRANE PACKING COMPANY**
OFFICES IN ALL PRINCIPAL CITIES

When inquiring check CP 5620 opposite last page


TC
INDUSTRIAL CHEMICALS
We mine and are basic producers of Copper, Iron, Zinc and Sulfur. Our technical knowledge in these basic materials and their chemical derivatives is your assurance of exacting quality control and strict uniform consistency.
COPPER SULFATE
Industrial Crystals and all common grades.
MANGANESE SULFATE
65% Mn SO4. Designed specifically for inclusion in mixed fertilizer.
LIQUID SULFUR DIOXIDE
Highest commercial quality, available in tank cars, tank wagons, ton cylinders and 150-lb. cylinders.
MONOHYDRATED COPPER SULFATE
35% Copper as metallic packaged in steel drums at no extra cost.
MONOHYDRATED MANGANESE SULFATE
93% Mn SO4. H2O. Highest purity, technical grade ... NOT A BY-PRODUCT.
MONOHYDRATED ZINC SULFATE
36% Zinc as metallic. For agriculture and industry.
COPPER CARBONATE
55% Copper as metallic. Light and dense grades.
MANGANOUS OXIDE
Minimum 48% Manganese as metallic. Feeds, fertilizers, spray or dust grades.
CHLOROSULFONIC ACID
Iron less than 1.0 ppm as loaded. Water white. Delivered in glass-lined tank wagons, also in stainless steel drums.
CUPRIC CHLORIDE
37% Copper as metallic. Available in poly-lined drums or bags.
CUPRIC OXIDE
Minimum 76½% Copper as metallic. Technical grade ... NOT A BY-PRODUCT.
FERRIC SULFATE
Partially hydrated, free flowing granular form. Available in bags or bulk.
PARA TOLUENE SULFONIC ACID, ANHYDROUS
Other organic Sulfonic Acids.
Samples, Specifications and Detailed Information Upon Request—
TENNESSEE TC CORPORATION
617-29 Grant Building, Atlanta, Georgia

When inquiring check CP 5621 opposite last page

new literature

Industrial bulletins pertinent to the reader . . . offering data on products, processes, services

Covers cathodic protection with polyethylene cable

Methods for cathodically protecting a number of different types of structures are illustrated and described in four-page manual on polyethylene cable. This cable has been shown to be outstanding in this application. It has excellent aging, weathering, and abrasion resistance and withstands moisture, acids, alkalis, oils, and greases. It gives excellent performance in moist locations.

Bul DM-5450 is issued by Anaconda Wire & Cable Co., Dept. CP, 25 Broadway, New York 4, N.Y. When inquiring specify CP 5622 on form opposite last page.

Discusses electronic control of liquid level

Describing electronic liquid level controllers, four-page bulletin in two colors suggests applications and gives specifications. Special applications are mentioned: indication or control of specific gravity in evaporators, flotation chambers, mixing vats, or an interface between two dissimilar liquids in one container. Booklet also includes discussion of principle of operation.

Bul F-100 is issued by Fisher Governor Co., Dept. CP, Marshalltown, Iowa. When inquiring specify CP 5623 on form opposite last page.

Aids selection of steam ejectors for general vacuum service

Selection of single and two-stage stock steam ejectors for general vacuum service is described in 60-page engineering manual. Application ranges, selection tables, dimensional and installation data, and parts lists are covered. Engineering reference section is designed to familiarize reader with ejector terminology and principles. Appendix provides air-water vapor saturation curves, air density tables, molecular weights of common gases, and pressure-temperature conversions.

Bul W-205-E21 is available on letterhead request to Worthington Corp., Dept. CP, Harrison and Worthington Ave., Harrison, N.J.

Describes mixer-reactors for pilot plants

Pilot plants for continuous reactions are described and illustrated in four-page bulletin. The mixer-reactors can receive additives at any time during the reaction and can also act as heat exchangers. Units are adaptable to alkylation, hydrolysis, oxidation, polymerization, sulfonation, and similar processes.

Bul 287 is issued by the Marco Company, Inc., Dept. CP, Saginaw, Michigan. When inquiring specify CP 5624 on form opposite last page.

Properties and fabrication of molybdenum disilicide

Molybdenum disilicide compounds have outstanding oxidation and corrosion resistance and superior stress-rupture strength at high temperatures. Applications are as refractories. Two bulletins cover the subject. Bulletin Cdb-6 gives complete information on the silicides and includes 53 references in its eight pages. Bulletin CH-23 is a two-page bulletin that discusses fabrication of parts.

Molybdenum silicide bulletins are issued by Climax Molybdenum Co., Dept. CP, 500 Fifth Ave., New York 36, N.Y. When inquiring specify CP 5625 on form opposite last page.

Corrosion-proofing materials covered in brochure

Methods for controlling corrosion through use of cement mortars, interliners, protective coatings, and linings are covered in eight-page brochure. Installations surveyed include linings in acid concentrators, stacks, pickling tanks; brick and tile floors for chemical plants as well as sumps; pits and trenches for handling industrial wastes. Charts are provided for selection of proper cement mortars. Section on protective coatings and linings is based on field test work.

Bul CP-614 is issued by Pennsylvania Salt Manufacturing Co., Dept. CP, 3 Penn Center Plaza, Philadelphia 2, Pa. When inquiring specify CP 5626 on form opposite last page.

Drawings illustrate boilers and metal fabrication

Engineering drawings illustrate boiler design for units of capacities up to 500,000 pounds of steam per hour on 16 pages of 22-page bulletin. Also included are photographs of company's custom metal fabricating facilities. Units for waste heat application and those designed to utilize refuse for fuels are also illustrated.

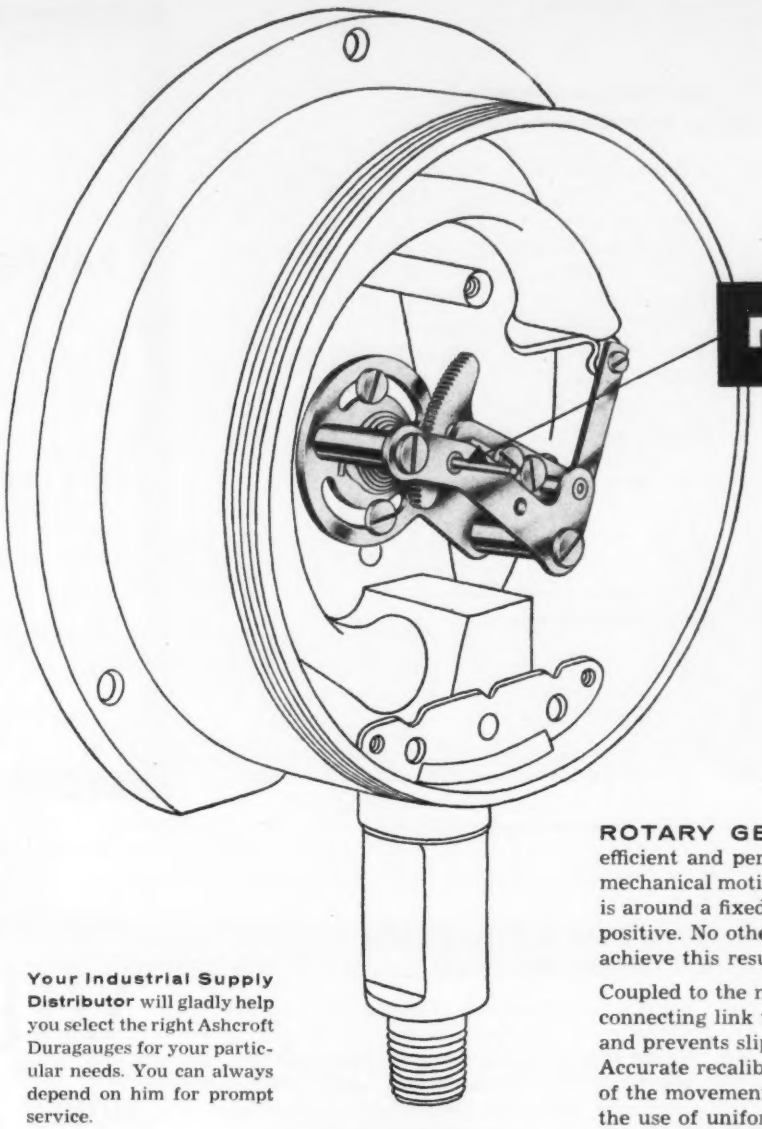
Bul 55-1 is available from Wickes Boiler Co., Dept. CP, 515 N. Washington Ave., Saginaw, Mich. When inquiring specify CP 5627 on form opposite last page.

Lists thermistor actuated indicators and controls

Describing laboratory apparatus for applications from amino nitrogen determinations to wet mill processes, 32-page laboratory supply catalog also lists thermistor actuated indicators and controllers. Other apparatus described include automatic titrators, centrifuges, combustion furnaces, heaters, water baths.

"Sargent Laboratory Instruments" is issued by E. H. Sargent & Co., Dept. CP, 4647 W. Foster Ave., Chicago 30, Ill. When inquiring specify CP 5628 on form opposite last page.

"WOW!!! IT SAYS, 'A STRONG, DURABLE THREAD MAY BE MADE FROM THE LINEAR POLYAMIDE OF HEXAMETHYLENE DIAMINE AND ADIPIC ACID'!"



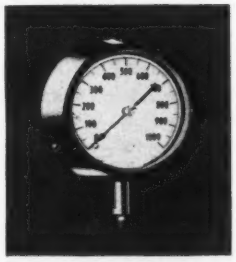
Why does the MOVEMENT in the ASHCROFT DURAGAUGE outperform all other types?

ROTARY GEARED MOTION, the most efficient and perfect method of transmitting mechanical motion ever developed. Because rotation is around a fixed center, pointer position is always positive. No other type of movement can ever achieve this result.

Coupled to the movement is a one-piece connecting link that guarantees correct calibration and prevents slippage or parting under tension. Accurate recalibration is easy from front or rear of the movement. Universal adjustability permits the use of uniformly graduated dials, thereby facilitating maintenance.

The Ashcroft Duragauge is available with all-stainless-steel movement or stainless steel with nylon bearings and pinion gear. There are case designs and materials, Bourdon tube materials, pressure ranges and dial sizes to meet your service conditions exactly. Save time, trouble and money. Specify the pressure gauges of highest sustained accuracy and durability – Ashcroft Duragauges.

Your Industrial Supply Distributor will gladly help you select the right Ashcroft Duragauges for your particular needs. You can always depend on him for prompt service.



1850 ASHCROFT U.S.A

In Canada: *Manning, Maxwell & Moore of Canada, Ltd., Galt, Ontario*

ASHCROFT GAUGES

MANNING MAXWELL & MOORE M&M TRADE MARK

A product of **MANNING, MAXWELL & MOORE, INC.** STRATFORD, CONNECTICUT

MAKERS OF 'AMERICAN' INDUSTRIAL INSTRUMENTS, 'CONSOLIDATED' SAFETY AND RELIEF VALVES, 'AMERICAN-MICROSEN' INDUSTRIAL ELECTRONIC INSTRUMENTS, *Stratford, Conn.* 'HANCOCK' VALVES, *Watertown, Mass.* 'CONSOLIDATED' SAFETY RELIEF VALVES, *Tulsa, Oklahoma.* AIRCRAFT CONTROL PRODUCTS, *Danbury & Stratford, Conn. and Inglewood, Calif.* "SHAW-BOX" AND 'LOAD LIFTER' CRANES, 'BUDGIT' AND 'LOAD LIFTER' HOISTS AND OTHER LIFTING SPECIALTIES, *Muskegon, Mich.*

When inquiring check CP 5629 opposite last page

NITROMETHANE
CH_3NO_2

NITROETHANE
$CH_3CH_2NO_2$

1-NITROPROPANE
$CH_3CH_2CH_2NO_2$

2-NITROPROPANE
$CH_3CHNO_2CH_3$

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Nitroparaffins
AND DERIVATIVES

NEW CHEMICAL FAMILY
FOR VARIED USES

SOLVENTS

REDUCING AGENTS

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RAW MATERIALS

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DISPERSING AGENTS

Learn how the Nitroparaffins may be of help in improving your present product or in creating new products.

write:

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SOLVENTS CORP.
260 MADISON AVE.
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Branches in principal cities

When inquiring check CP 5630 opposite last page

NEW LITERATURE

Injection molding techniques for polyethylene reported

Injection molding techniques for polyethylene are subject of 16-page bulletin. Mold design, molding machine selection, molding conditions, material handling, and finishing are among the subjects covered. Photographs and line drawings are used to illustrate variety of products produced by injection molding operations. Physical, thermal, electrical, and other physical properties of polyethylene are included.

Bul C-5-225 is issued by Chemical Div., Koppers Company, Inc., Dept. CP, Koppers Bldg., Pittsburgh 19, Pa. When inquiring specify CP 5631 on form opposite last page.

Basic design expounded for multi-point temps

Basic designs and typical applications are shown for multi-point thermocouple assemblies in illustrated data sheet.

Data Sheet 8553 is issued by Trinity Equipment Corp., Dept. CP, 472 Westfield Ave., East, Roselle Park, N. J. When inquiring specify CP 5632 on form opposite last page.

Tells of safety and dependability of diaphragm pump

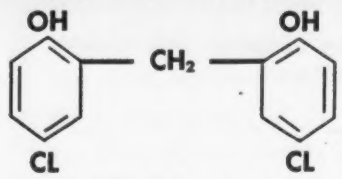
Safety and dependability of all-purpose, positive-displacement, diaphragm pump used in feeding variety of chemical solutions is treated in two-page data sheet. Operating data table, performance curve, and list of chemical solutions that can be handled are also presented. Section of data sheet describes unit's operation, construction, and advantages.

Bul 1201 is available from Proportioneers, Inc., Div. of B-I-F Industries, Inc., Dept. CP, 345 Harris Ave., Providence, R.I. When inquiring specify CP 5633 on form opposite last page.

Gives comprehensive compilation of controller renewal parts

Complete compilation of controller renewal parts for electric apparatus and motor controls is presented in 96-page catalog. Company's actual inventory of all listed items is stressed.

Cat 55 is available from Brownell Distributors, Inc., Dept. CP, 306 Canal St., New York 13, N.Y. When inquiring specify CP 5634 on form opposite last page.



Mildew or Bacteria problem?

G-4®

(DICHLOROPHENE)

Here is a potent and versatile fungicide and bactericide that offers special advantages in a wide variety of applications. It may be *exactly* the preservative you are seeking to solve a deterioration problem or improve the salability of a product.

G-4 is safe to use, and it is used in cosmetic, pharmaceutical and veterinary products. It is light in color, low in odor. Other uses include textiles, cutting oils, disinfectants, paper, emulsions. We welcome your request for samples and technical information.

SINDAR® Corporation
Industrial Aromatics and Chemicals
330 West 42nd Street, New York 36, N. Y.

When inquiring check CP 5635 opposite last page

EFFECTIVE, ALL-DIRECTIONAL
VIBROLATION

MOVES GRANULAR OR WET MATERIAL NOISELESSLY

The simplest, most quiet answer for moving materials in hoppers, chutes and bins. One moving part, no lubrication, no maintenance, never harms the equipment on which it is mounted. Instantly self-starting every time. Vibrolator is the only vibrator that can guarantee this regardless of operating conditions. Write for catalog. You will also receive form for describing your problem. No obligation!

VIBROLATORS®

®Vibrolator is a registered trade name and applies only to the patented Peterson Vibrolator.

MARTIN ENGINEERING COMPANY
155 KEMP ST. NEPONSET, ILL.

When inquiring check CP 5636 opposite last page

Includes optical diagram and Raman spectra

Discussing manufacturer's Model 81 Cary Raman spectrophotometer, bulletin of five pages includes a schematic optical diagram. A summary of specifications is also given. Typical performance of the unit is illustrated by sample spectra for benzene, cyclohexane, and sodium benzene sulfonate. Light gathering power of the instrument described has been improved over previous instruments.

Bul RB-2-57-5C is issued by Applied Physics Corp., Dept. CP, 362 W. Colorado St., Pasadena, Calif. When inquiring specify CP 5637 on form opposite last page.

Discusses instant lighting in emergencies

Printed in two colors, eight-page bulletin shows several arrangements for instantaneous emergency lighting. Specifications are made for various plant locations and safety problems.

1956 Catalog is issued by Electric Cord Co., Dept. CP, 195 William Street, New York 38, N.Y. When inquiring specify CP 5638 on form opposite last page.

Isopropyl ether: applications, charts, specifications

Technical bulletin of eight pages tells all about isopropyl ether. A solvent-extractant and an alkylating and blending agent, the compound is used in the mineral and vegetable oil industries, pharmaceutical and textile industries. Five pages of tables and graphs are in the bulletin.

Bul F-40003 is issued by Carbide & Carbon Chemicals Co., a div. of Union Carbide & Carbon Corp., Dept. CP, 30 E. 42nd St., New York 17, N.Y. When inquiring specify CP 5639 on form opposite last page.

Describes earth-moving unit

Engineering, design, construction and mechanical features of scraper are outlined in two-color bulletin. Photographs and drawings illustrate 20 cu yd unit. Operator facilities are also outlined, and complete specifications are included.

Bul MS-663 is issued by Allis-Chalmers Manufacturing Co., Dept. CP, 1151 S. 70th St., Milwaukee, Wis. When inquiring specify CP 5640 on form opposite last page.

Thousands of pressure vessels like these have been produced for the A.E.C. by Newport News, ahead of contract delivery schedule. Nickel-plated inside and out, they withstand corrosive uranium-hexafluoride gas.

When the pressure's on for pressure vessels

Specialized production techniques and the skill of Newport News craftsmen operating vast fabricating shops team up to deliver trainloads of pressure vessels on schedule.

When it comes to turning out process equipment, Newport News has the facilities and experience. So get a bid from Newport News on your present or future projects. Get the benefit of plant methods developed by specialists producing pressure vessels, vacuum tanks, towers, reactors, weldments and sub-assemblies.

Look over the scores of ways in which Newport News can help you . . . send for the easy-to-read, illustrated booklet *Facilities and Products*. It's yours for the asking.

Engineers: Desirable positions available at Newport News for Designers and Engineers in many categories. Address inquiries to Employment Manager.

Newport News
Shipbuilding and Dry Dock Company
Newport News, Virginia

When inquiring check CP 5641 opposite last page

152

Estimating Cost of Scale Errors

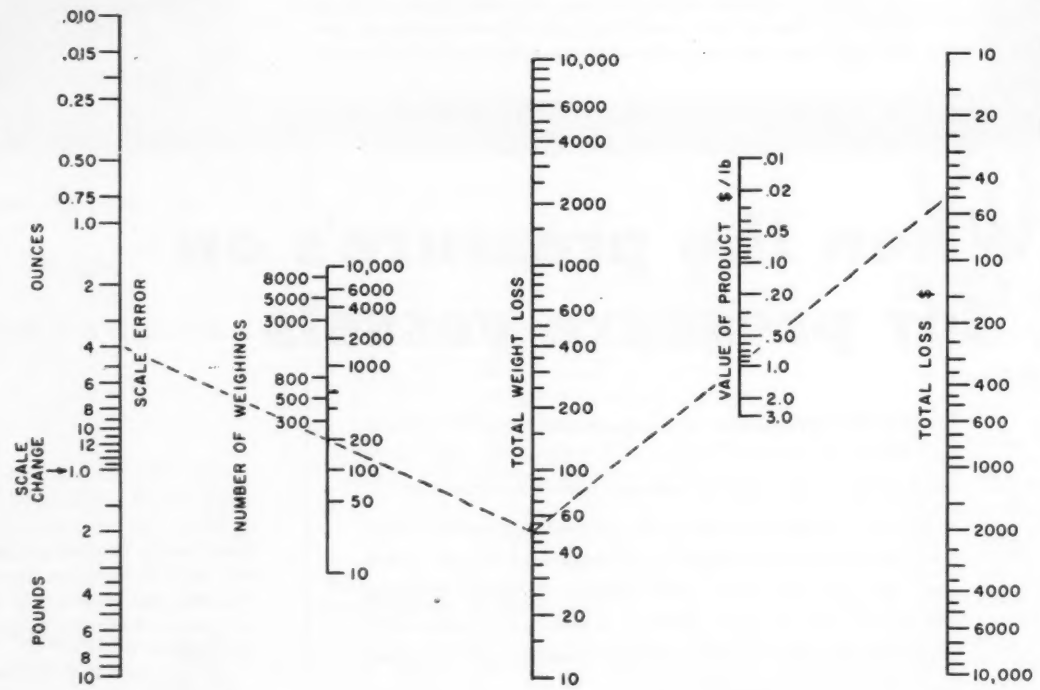
Data furnished by
NATIONAL ASSOCIATION OF SCALE MANUFACTURERS, INC.

Nomograph by BRUCE FADER, Associate Editor

Because scales do not show any visible signs of being out of adjustment (unless checked) it is very possible that weighing errors can creep into operations involving scales. These errors can be costly in cases of repetitive weighing . . . a one ounce error can cost $1875 in a year if 100 weighings on material worth $1 per pound are made every day.

Typical Example

Nomograph presented here makes it possible to find cost of scale error. Start with a four-ounce error in each weighing. Connect 4 on scale error-scale with number of weighings (200 in this case) and read total error of 50 pounds. For material worth $1 per pound, this obviously represents $50.



CUT HERE AND FILE

O-RINGS
are a valve's best friend

Let's face it . . . dripping, leaky valves are just not socially acceptable . . . so, we designed the new Hoke bar stock needle valve with an O-ring stem seal—to give it the right start in life. Result—a seal that will pass a helium leak test and no leaky, messy packing adjustments—ever. No friction either (even at high pressure)—you can operate the valve with a fingertip touch. There's a new, self-aligning spindle which shuts off tight time after time without galling or binding.

As you can see, the Hoke bar stock valve will contribute ease of operation, low maintenance cost and neat appearance to your equipment—hydraulic, pneumatic, instrument panel or test stand. It's available from stock in a wide range of sizes (⅛" to½" pipe) and materials (carbon, chrome or stainless steel and brass) . . . panel mounting, too if you need it. We'd like to send you our Bulletin.

P.S. We've just published a new wall chart on Hoke valves with valuable information on valve sizing and corrosion resistance. May we send you one?

HOKE
HOKE INCORPORATED
Fluid Control Specialists
145 S. DEAN STREET, ENGLEWOOD, N. J.

When inquiring check CP 5642 opposite last page

Engineering information given on hose assemblies, couplings

Complete engineering information on factory-assembled hose assemblies, adapter unions, pipe fittings, reusable and clamp-type couplings, and bulkhead adapter unions is given in series of catalogs. Flow charts, thread information, dimensional diagrams, and other engineering aids are included.

Cat 100, 200, and 300 are issued by Anchor Coupling Co., Inc., Dept. CP, 342 N. Fourth St., Libertyville, Ill. When inquiring specify CP 5643 on form opposite last page.

Polyester products for hand lay-up and surface finishing uses

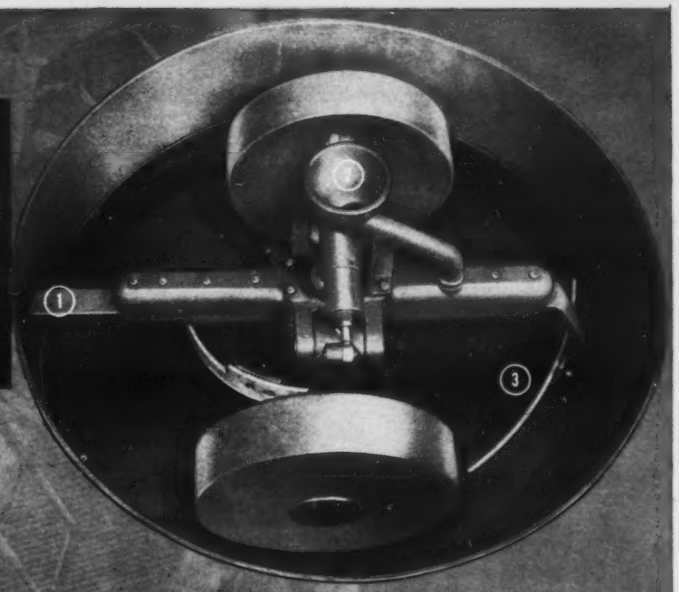
Seventeen-page stapled notebook combines eight technical information bulletins on resins and other polyester products used in hand lay-up applications. Thickening agents, mold release coatings, and other hand lay-up molding accessories are included. Properties, handling are discussed.

"Polyester Resin Technical Bulletins" is issued on direct letterhead request to Finishes Div., Inter-Chemical Corp., Dept. CP, PO Box 659, Newark 1, New Jersey.

"YOU SHOULD HAVE SEEN THE ONE THAT GOT AWAY!"

A tip of the beret to Walt Schaefer for the above cartoon. Walt hails from Rochester, N.Y., and works for Eastman Kodak

HERE'S WHY THERE'S
NO BUILD-UP PROBLEM
WITH
SIMPSON
MIXED MATERIALS



Automatic, bottom discharge and self cleaning action speeds mulling and reduces mixer maintenance

The photo above offers proof of why the Simpson Mix-Muller is preferred by operators who want a *thorough* blend of dry, wetted or plastic materials.

Take a good look at it—you can see why this simple, efficient design can assure these *welcome* mixing features:

A CLEAN MIX — (1) Crib scraper and plow action *eliminate* build up of material, guard against contamination of mix and assure formula control. Muller scrapers are available, too. (2) An integral funnel guides liquid additions to path of mullers to assure no waste and fast mixing.

A THOROUGH MIX — Fast efficient muller and plow action quickly disperses minute quantities of ingredients. Bottom discharge (3) is automatic, almost instantaneous.

AN ECONOMICAL MIX — You use less horsepower because power is used only to mix — *not* to drive pan or power discharge. You can gain *absolute* control over character of mix. Result? A controlled mix and *an end product* faster, and at less cost.

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SIMPSON *MIX-MULLER*® DIVISION
NATIONAL ENGINEERING CO., 640 Machinery Hall Bldg., Chicago 6, Ill.

When inquiring check CP 5644 opposite last page

153

Percentage of Residual Chlorine in Bleached Paper Pulp

BY CLAUDE MCQUILLEN, JR.
H. & W. Div., Scott Paper Company, Mobile, Alabama

Edited by Chemical Processing Staff

This nomograph can be used to determine how much chlorine is left in pulp after bleaching. It applies to chlorine or hypochlorite bleaching, but a correction must be made when it is used to find residuals if chlorine itself is used for bleaching. Determination is based on titration with sodium thiosulfate. Before entering the nomograph, 0.2 ml of 0.1N $Na_2S_2O_3$ should be subtracted from the total quantity required.[1] This allows for chlorine loosely bound but still reactable. No such correction is required if hypochlorite is used for bleaching.

Nomograph is based on an equation where consistency of the pulp enters twice. Thus two consistency scales are used in the nomograph — though for any pulp sample, same consistency will be located on each scale. Basic equation is

$$R = \frac{0.3551(100 - C)}{100\,C}$$

where

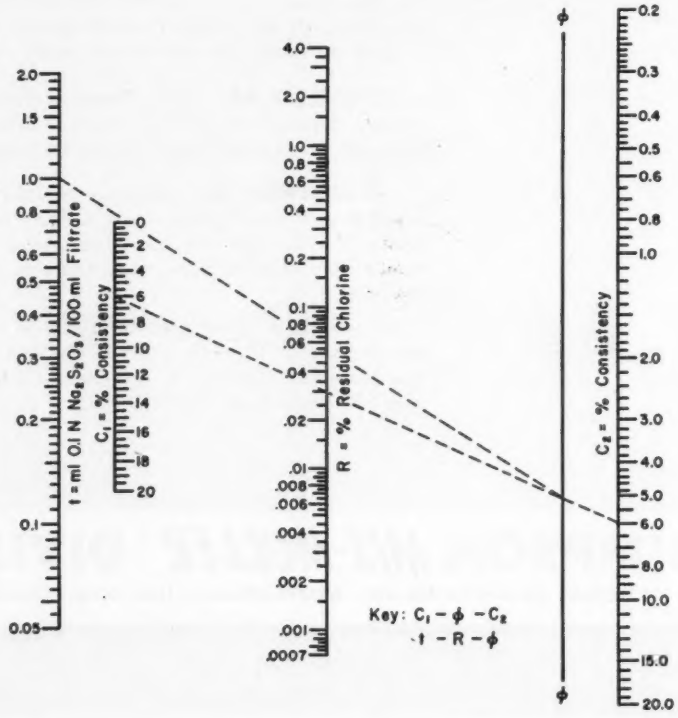
R	= residual chlorine in basic pulp	%
t	= volume of 0.1N sodium thiosulfate	ml
C	= pulp consistency	%

Typical Example

Stock sample has a 6 percent consistency and a titration value of 1 ml of 0.1N sodium thiosulfate. What is its percentage of residual chlorine?

Find 6 on both consistency scales (C_1 and C_2). Align these to find reference point on ϕ-scale. Connecting this point with 1 on t-scale indicates 0.055 percent residual chlorine (on R-scale).

LITERATURE CITED
(1) "Bleaching of Pulp," TAPPI Monograph No. 10, Ch 15, pp 336-337



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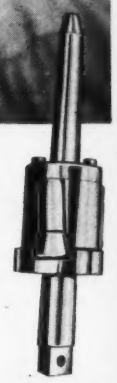
Wilson Tube Expanders offer smooth, efficient rolling action, which insures firm seating of the tube, provides perfectly rolled joints, reduces time-wasting re-rolling and re-inspection. For example, Wilson Model 38 Tube Expander, shown here, is a popular tool which rolls and flares in a single operation. It is available for tubes from 1" OD to 4½" OD with various roll lengths for tube sheets ½" and up in thickness.



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When inquiring check CP 5645 opposite last page

Details of small pumps for chemical service

Complete line of small rotary displacement and centrifugal pumps for chemical service is described and illustrated in four-page bulletin. Units are available in a variety of corrosion-resistant materials.

Bul on small chemical pumps is issued by Eco Engineering Co., Dept. CP, 12 New York Ave., Newark 1, N.J. When inquiring specify CP 5646 on form opposite last page.

Product, installation photos of butterfly valves shown

Tight-closing, rubber-seated butterfly valves are shown in four-page illustrated bulletin. Photographs show various valve models in typical installations. Descriptions of components, operators, and valve accessories are included. Design specifications and main advantages are listed.

Bul 650-L1B is available from Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Dept. CP, 345 Harris Ave., Providence, R.I. When inquiring specify CP 5647 on form which is located opposite last page.

Monomeric plasticizer for vinyls used in high-temp insulation

Cabflex HS-10, an alkyl aryl phthalate plasticizer, is recommended for vinyl wire insulation rated above 90°F. Three-page bulletin gives the details, along with six suggested formulations.

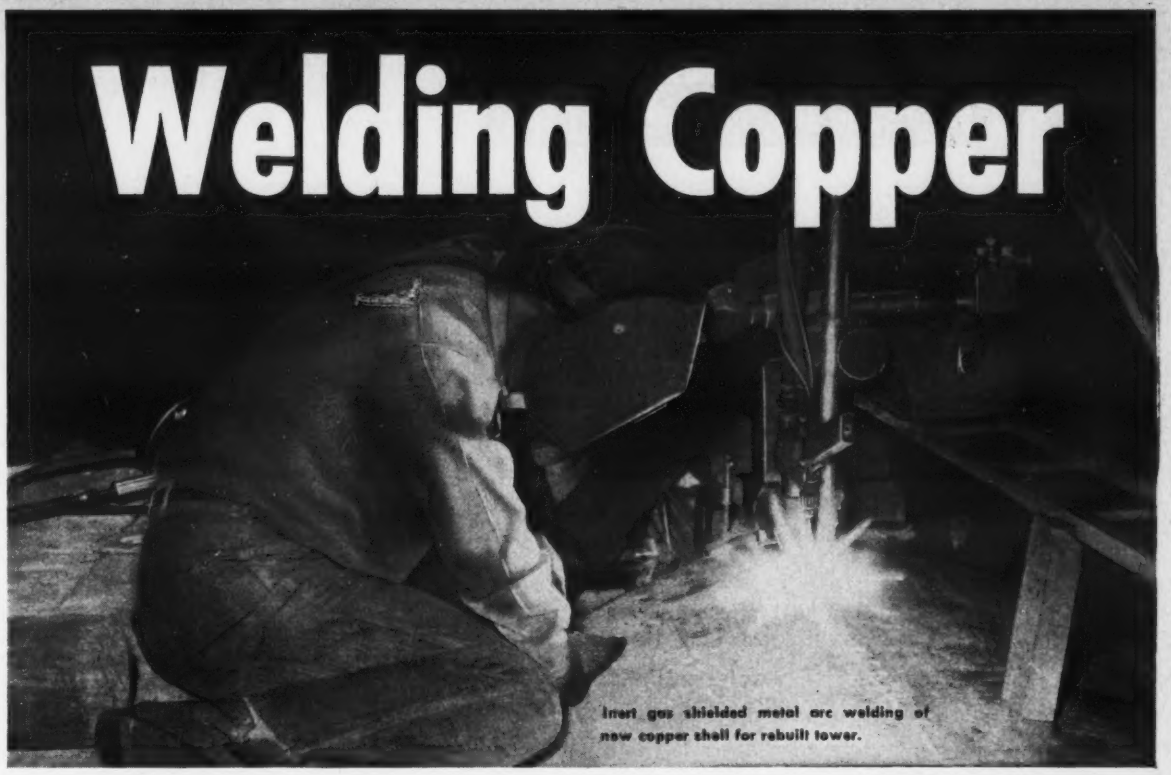
Bul PC-7 is issued by Plastics Chemicals Div., Godfrey L. Cabot, Inc., Dept. CP, 77 Franklin St., Boston 10, Mass. When inquiring specify CP 5648 on form opposite last page.

Suggests packaging techniques to cut shipping costs

Revised edition of 24-page booklet on shipping in corrugated boxes discusses design of a corrugated box, testing, storage, shipping room layout, packing, sealing, stacking, and loading. Illustrations explain techniques used to cut costs. Four case histories indicate how careful box design and packaging room operations reduce shipping costs.

"How To Ship More Economically" is issued by Hinde & Dauch, Subsidiary of West Virginia Pulp and Paper Company, Dept. CP, 5103 Decatur St., Sandusky, Ohio. When inquiring specify CP 5649 on form opposite last page.

Welding Copper



Inert gas shielded metal arc welding of new copper shell for rebuilt tower.

SAVES 38% in materials and labor for joining

Some time ago, the Tennessee Eastman Company, Kingsport, Tennessee, a Revere customer, began to rebuild some of its copper stills or fractioning towers, which previously would have been silver-brazed. Revere's welding specialists were called in to see whether or not welding would be superior. Demonstrations were made to Tennessee Eastman engineers and shop personnel, with the result that welding was adopted. Actual experience in the shop shows a saving of 38% in materials and labor for joining, and a better job in every way. The welding method used is the inert gas shielded metal arc process.

Reconstruction of the towers was made to reduce the number of flanges. At the same time Tennessee Eastman changed from the flange joint tray construction to the inserted tray type and incidentally, reduced the number of gaskets with their accompanying maintenance problems. The trays are salvaged by shearing off the bolt hole circle and folding up the edges. The towers are some 45' high, 6' to 10' in diameter. with a tray or bubble cap plate at specified intervals. Tennessee Eastman plans to rebuilt several towers a year in this economical way.

It will pay you as it did Tennessee Eastman to look into welding as a modern method of joining copper. Remember Revere is fully experienced in the most modern and efficient methods, and will collaborate with you on their application.

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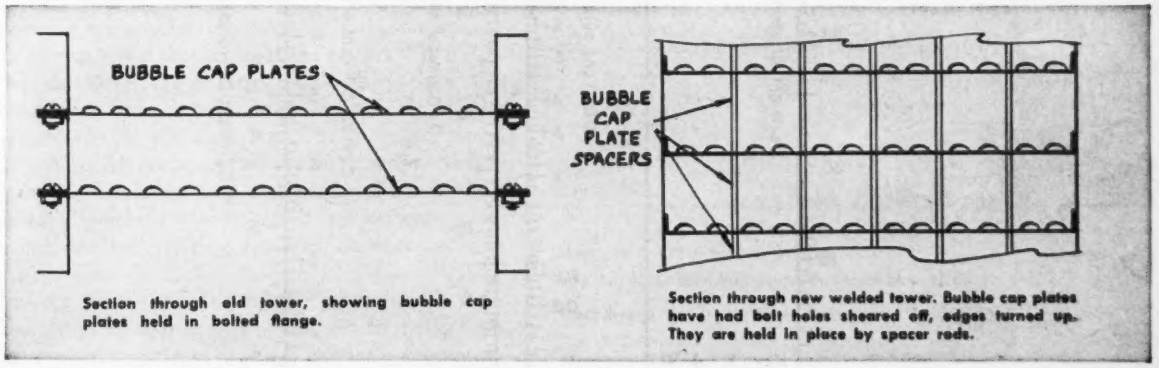


Section through old tower, showing bubble cap plates held in bolted flange.

Section through new welded tower. Bubble cap plates have had bolt holes sheared off, edges turned up. They are held in place by spacer rods.

When inquiring check CP 5650 opposite last page

Pulp Inventory Nomograph for Bleach Plants

By GEORGE W. LEWIS, JR.
H. & W. Div., Scott Paper Company, Mobile, Alabama
Edited by Chemical Processing Staff

In the pulp and paper industry, operators of bleach plants frequently calculate the weight of oven-dry (moisture-free) pulp in towers by means of the equation

$$I = \frac{62.5 \pi h D^2 C_o}{4 \times 2000 \times 100}$$

which simplifies to

$$I = 2.454 h D^2 C_o \times 10^{-4}$$

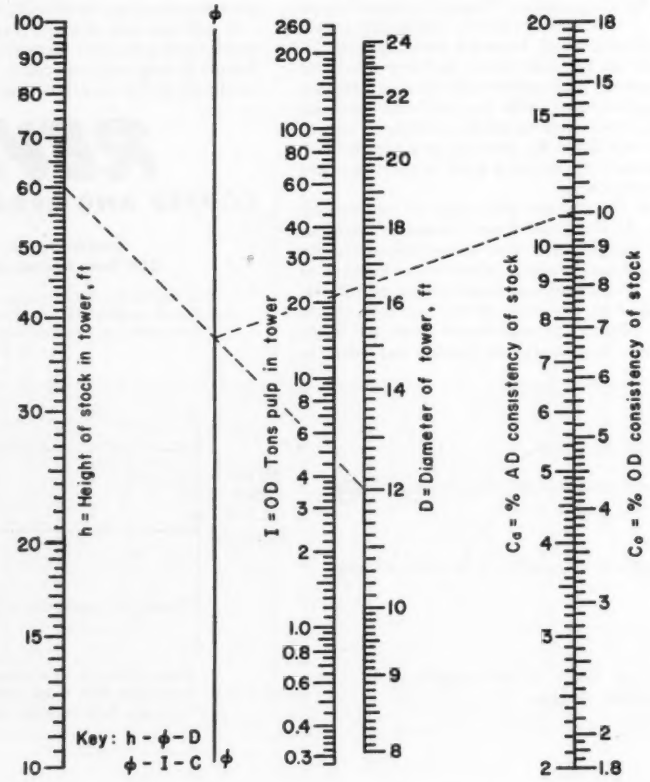
where —

I	= weight of oven-dry pulp in tower	tons
h	= height of stock in tower	ft
D	= average diameter of tower (assumed to be right circular cylinder)	ft
C_o	= percentage oven-dry consistency of stock	%
62.5	= weight of cubic foot of stock of any likely consistency of the stock	lb

Typical Example

A tower 12 feet in diameter holds stock to a height of 60 feet. If stock consistency is 10 per cent oven-dry (11.11 per cent air dry — based on 10 per cent moisture for air-dry pulp), how much stock is on hand?

Connect 60 on h-scale with 12 on D-scale and find point on reference line φ. Then connect this point with 10 on C_o-scale (or 11.11 on C_a-scale) and read content as 21.21 tons on I-scale.


h = Height of stock in tower, ft
I = OD Tons pulp in tower
D = Diameter of tower, ft
Ca = % AD consistency of stock
Co = % OD consistency of stock
Key: h - φ - D
φ - I - C

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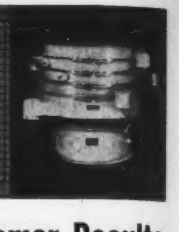
SCREENING NEWS



Here's Why SWECO Customer Results Stories Often Are "Trade Secrets!"

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"Screen replacement . . . $60 per million gals. of slip." — Ceramic Manufacturer

"936% more efficient–by test." — Chemical Company

"4½ years same unit, same screen." — Chemical Company

"Ten minutes to change or clean screens." — Fish Processor

"Nets $40/hour in recovery of process waste." — Grain Processor

"Turned process headache into profit item." — Northwest Fruit Processor

"Four SWECOS save us $100 per day." — Limestone Manufacturer

"Frees manpower–quadruples screening rate." — Metal Processor

"The SWECO paid for itself the first time it was used." — Major Oil Company

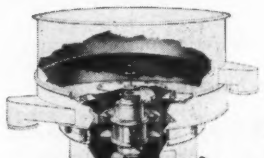
"Saving 8¢ per gallon." — Paint Maker

"Recovering new product–formerly waste." — Large Rubber Company

"We save $75.00 daily with two SWECOS." — Stone Products Company

"98% Sizing efficiency on silica sand." — Large Sand Corporation

"Screen cost less than $26.00 per month." — Tungsten Processor



SWECO "3-D" SCREENING ACTION tumbles material in three directions at once . . . increases efficiency as much as 10 to 1.

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When inquiring check CP 5651 opposite last page

NEW LITERATURE

Specifies 68 hoses for plant use

Printed in two colors, eight-page foldout brochure describes 68 rubber hoses for industrial applications. Several of the hoses described are new additions to manufacturer's line. Brochure also contains data on nine types of conveyor belts, as well as flat power-transmission belting, multiple and fractional hp V-belts, and other rubber products.

Form 3765-R is issued by the Thermoid Co., Dept. CP, 400 Whitehead Rd., Trenton, N. J. Specify CP 5652 opp. last page.

Cutaways show features in pump bulletin

Large cutaway views are used to show construction and operational features of vacuum and condensate pumps in 28-page bulletin. Pump selection guides help user in choosing correct unit for job to be done. Complete specifications and selected installation diagrams are included.

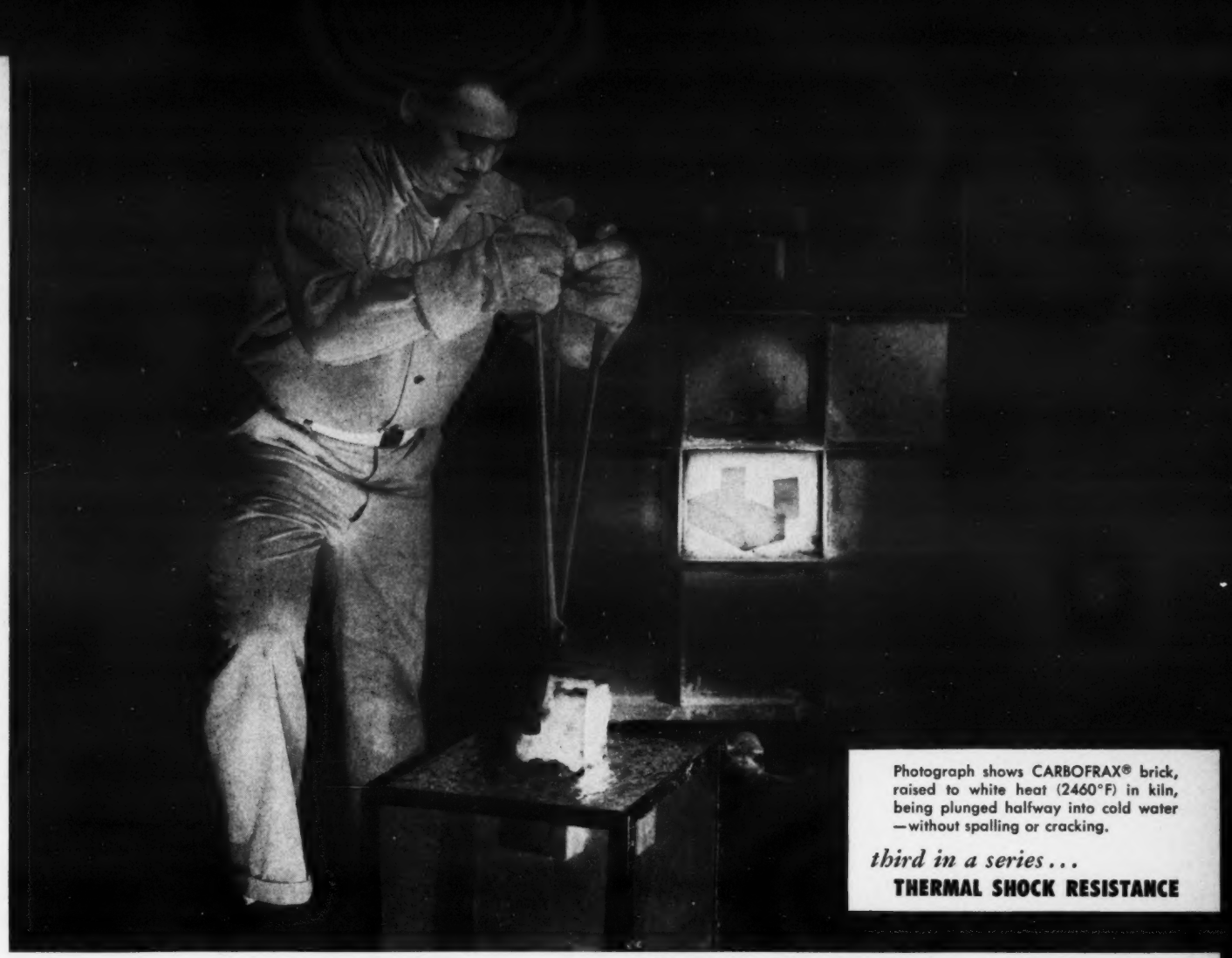
Bul 1465 is available from Dept. P, Sarco Company, Inc., Dept. CP, Empire State Bldg., New York 1, N.Y. Specify CP 5653 opposite last page.

What's new in services for safety

Printed in two colors, 24-page booklet shows several incentive prizes, safety guides, manuals, and printed material for maintaining safety consciousness. Prices are given.

"What's New" is issued by National Safety Council, Dept. CP, 425 N. Mich. Ave., Chicago, Ill. Specify CP 5654 opp. last page.

For more information on product at right, specify CP 5655 . . . see information request blank opposite last page.



Photograph shows CARBOFRAX® brick, raised to white heat (2460°F) in kiln, being plunged halfway into cold water —without spalling or cracking.

third in a series . . .
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Unusual Properties of Refractory Materials

Thermal Shock Resistance in a refractory enables it to withstand rapid recurring temperature changes without spalling and cracking. Several properties affecting the degree of resistance include: thermal conductivity, ultimate strength, thermal expansion and modulus of elasticity.

A number of refractories developed by Carborundum are noted for having these properties in the ranges that insure high heat shock resistance. They successfully meet the stresses and strains imposed by intermittent firing and by high heat releases in restricted areas. In packaged steam generator service, for example, they are far superior to other lining materials. Similarly, they have produced outstanding results in rapidly-heated quickly-cooled crucible type melting furnaces, in heat treating furnaces, incinerators, still settings, etc.

The current issue of Carborundum's magazine "Refractories" features a comprehensive article on heat shock. It may offer suggestions helpful to you in handling a condition of this nature. Send for your copy today.

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Pressure Drops in Cascade Coolers

By D. S. DAVIS
Professor of Chemical Engineering
Virginia Polytechnic Institute

A study of recent data[2] shows that for clean water flowing at 70°F through a Karbate sectional cascade cooler (Model CC-27A), pressure drop is given by

$$P_w = \frac{0.001503\ Q^{1.862}}{S^{4.59}}$$

where —

P_w =	pressure drop	psi per section
Q =	water rate	gpm
S =	size of pipes in cooler	in

For other liquids pressure drops are given by

$$P_l = P_w \mu^{0.14} \rho^{0.86}$$

where—

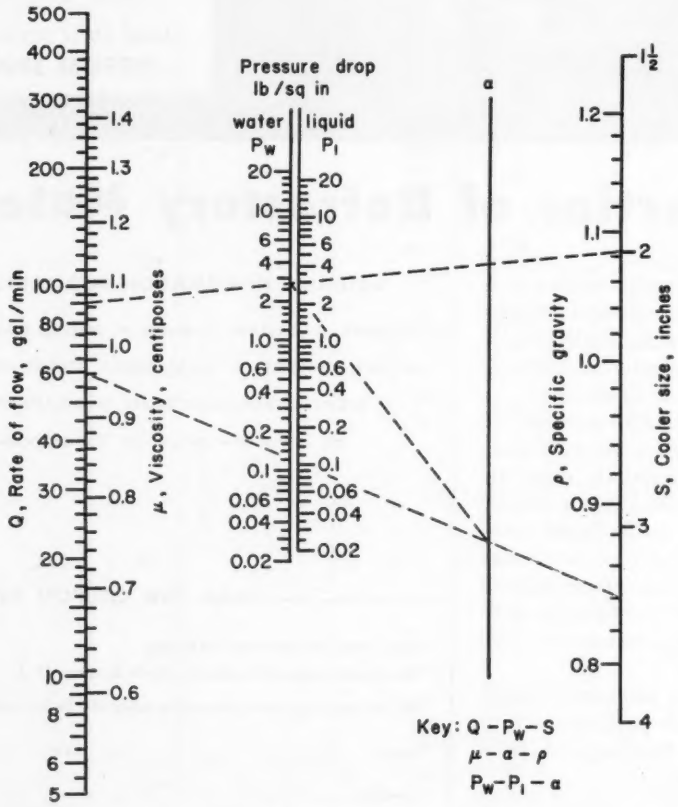
P_l =	pressure drop	psi per section
μ =	viscosity of liquid	cp
ρ =	specific gravity of liquid	—

This nomograph solves both equations quickly and accurately. Chart was constructed by well-known methods[1].

Typical Example

What is the pressure drop when clean water at 70°F flows at a rate of 90 gpm through a 2" Karbate sectional cascade cooler? Following nomograph key, connect 90 (Q-scale) with 2 (S-scale) and read desired value as 2.7 psi on P_w-scale.

If the flowing liquid has a viscosity of 0.96 centipoise and a specific gravity of 0.84, what pressure drop can be expected? Connect 0.96 (μ-scale) with 0.84 (ρ-scale) and note intersection on α-axis. Connect this point with 2.7 on the P_w-scale and read pressure drop as 2.3 psi on P_l-scale.



LITERATURE CITED

(1) DAVIS, D.S., "Nomography and Empirical Equations," Ch 6, Reinhold Publishing Corporation, New York (1955)
(2) "Karbate Sectional Cascade Coolers," p 9, Cat Sect "-6820, Union Carbide and Carbon Corp., (1953)

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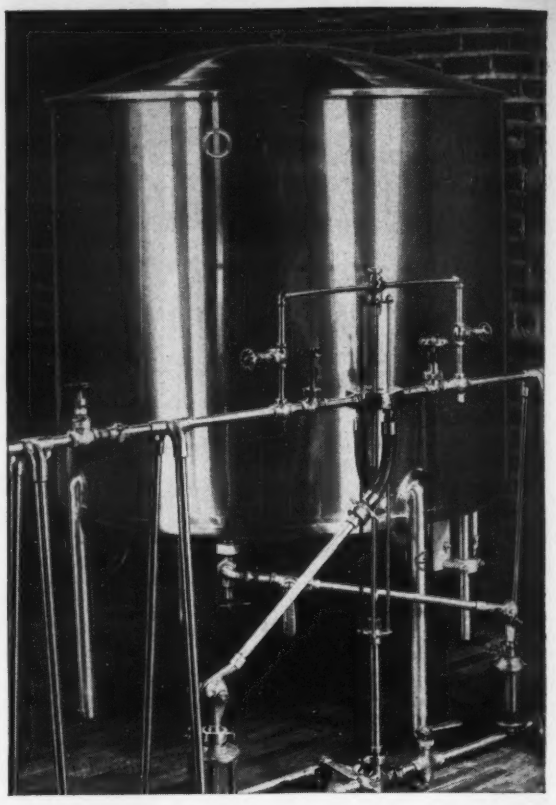

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When inquiring check CP 5656 opposite last page

Basic engineering data featured in butterfly valve catalog

Basic engineering data, complete enough to permit user to accurately size valves, are presented as part of 48-page catalog in loose-leaf form. Complete description, specifications, layout drawings, and dimensions of standard butterfly valves in each pressure rating are included. Section on special metals and modifications available for extreme operating conditions are listed.

Cat 160 is issued by S. Morgan Smith Co., Dept. CP, York, Pa. When inquiring specify CP 5657 on form opposite last page.

Treats low pressure boilers for hot water or steam

Completely revised eight-page catalog describes low pressure heating boilers for hot water or steam service. Cross section installation and dimensional views with complete engineering data for 19 standard sizes are presented. Photographs of individual units and typical installations aid in description.

Cat S-55 is available from Erie City Iron Works, Dept. CP, Erie, Pa. When inquiring specify CP 5658 on form opposite last page.

"I have a feeling that Dinkledorf has strayed from the original assignment."

Dick Murphy, in the Technical Lab of DuPont's Sabine River Works, Orange, Texas, contributed this cartoon.

They Handle the Tough Ones!

LaBour Pumps have been handling tough chemical jobs dependably for more than 30 years.

For example, the black liquor evaporating process of a large Southern paper mill, shown above, has LaBour pumps handling its particularly tough job. The designing engineers knew they could count on LaBour pumps to give them continuous daily service without breakdown, without stoppage.

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THE LABOUR COMPANY, INC. Elkhart, Indiana, U.S.A.

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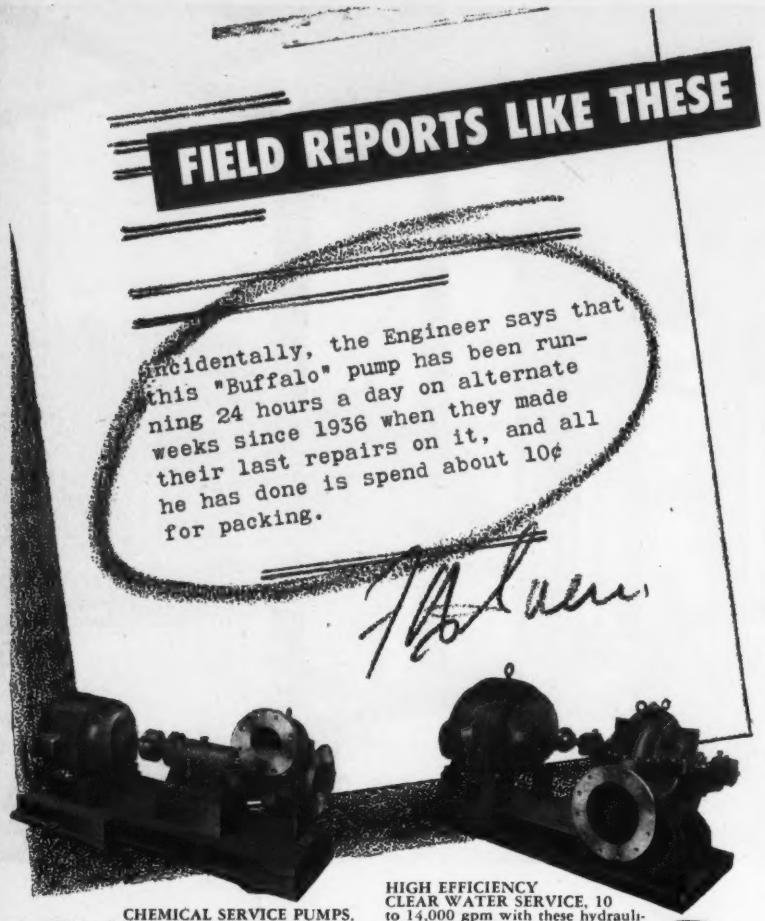
FIELD REPORTS LIKE THESE
Incidentally, the Engineer says that this "Buffalo" pump has been running 24 hours a day on alternate weeks since 1936 when they made their last repairs on it, and all he has done is spend about 10¢ for packing.

CHEMICAL SERVICE PUMPS. High-efficiency single suction in alloys to handle your liquid.

HIGH EFFICIENCY CLEAR WATER SERVICE. 10 to 14,000 gpm with these hydraulically balanced Double Suction Pumps. Write for Bulletin 955P.

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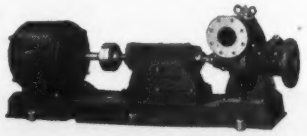

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NEW LITERATURE

Illustrates, describes double-duty filters

Complete line of double-duty filters for liquid clarification or solids recovery applications are described in series of six catalog sheets. Included are portable, mobile, and stationary units from 250 to 18,000 gph capacities. Filters can be cleaned in 15 minutes or less.

Catalog sheets are issued by Dept. NL, Bart-Messing Corp., Dept. CP, 229 Main St., Belleville, N.J. When inquiring specify CP 5661 on form opposite last page.

Includes specs on "reefers"

Bulletin of four pages in two colors lists 52 laboratory refrigerators ranging in capacity from two to 45 usable cubic feet. Temperature ranges are from ambient to −200°F. Standard and optional features are listed.

"Hot/Cold Temperature Cabinets" is issued by Webber Engineering Corp., Dept. CP, P. O. Box 217, Indianapolis, Indiana. When inquiring specify CP 5662 on form opposite last page.

Chlorinated paraffin reference manual

Of primary interest to makers of paints, plastics, printing inks, rubber, adhesives, mastics, and fabric finishes, Chlorowax chlorinated paraffin is comprehensively covered in 36-page manual. Six data tables and numerous photographs accompany the text.

"Your Fact File on Diamond Chlorowax" is issued by Chlorinated Products Div., Diamond Alkali Co., 300 Union Commerce Bldg., Cleveland 14, Ohio. When inquiring specify CP 5663 on the convenient Reader Service slip which is located opposite last page.

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90° Elbows

Protect product purity	Unions	Available in Monel* nickel-copper alloy and Nickel	Tees
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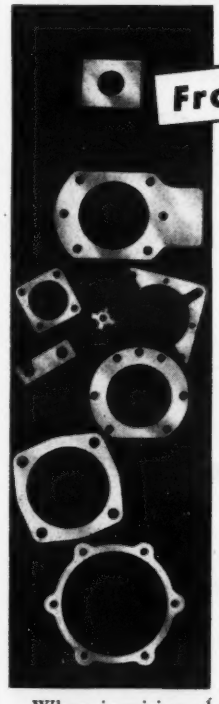

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With 50 years accumulation of dies, chances are we can furnish just what you need without a die charge—thus reducing costs substantially and assuring on-schedule delivery.

Gaskets, shims and washers can be supplied in metallic, non-metallic and plastics . . . teflon, nylon, etc. . . . and in quantities to meet your production requirements.

Write for catalog and submit your specifications for quotation.

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7717 South Avalon, Chicago 19, Illinois

When inquiring check CP 5665 opposite last page

Engineering data, uses listed for flexible metal hose

Typical applications, specifications, and cutaway views are used to describe corrugated flexible metal hose of annular and helical construction in four-page, two-color folder. Engineering data include bending radii, bursting pressures, and weights.

Bul 20-E is issued by Atlantic Metal Hose Co., Inc., Dept. CP, 308 Dyckman St., New York 34, N.Y. When inquiring specify CP 5666 on form opposite last page.

Handling industrial waste discussed in brochure

Historical development, operating features, and characteristics of manufacturer's treating plant for industrial waste are discussed in 28-page, 4-color brochure. Lists of typical installations are presented for various categories of water, waste, and brine treatment. A 41-entry bibliography is given.

Bul 1825 is issued by Infilco, Inc., Dept. CP, Box 5033, Tucson, Ariz. When inquiring specify CP 5667 on form opposite last page.

Describes uses, advantages of packaged Turbo-Dryer

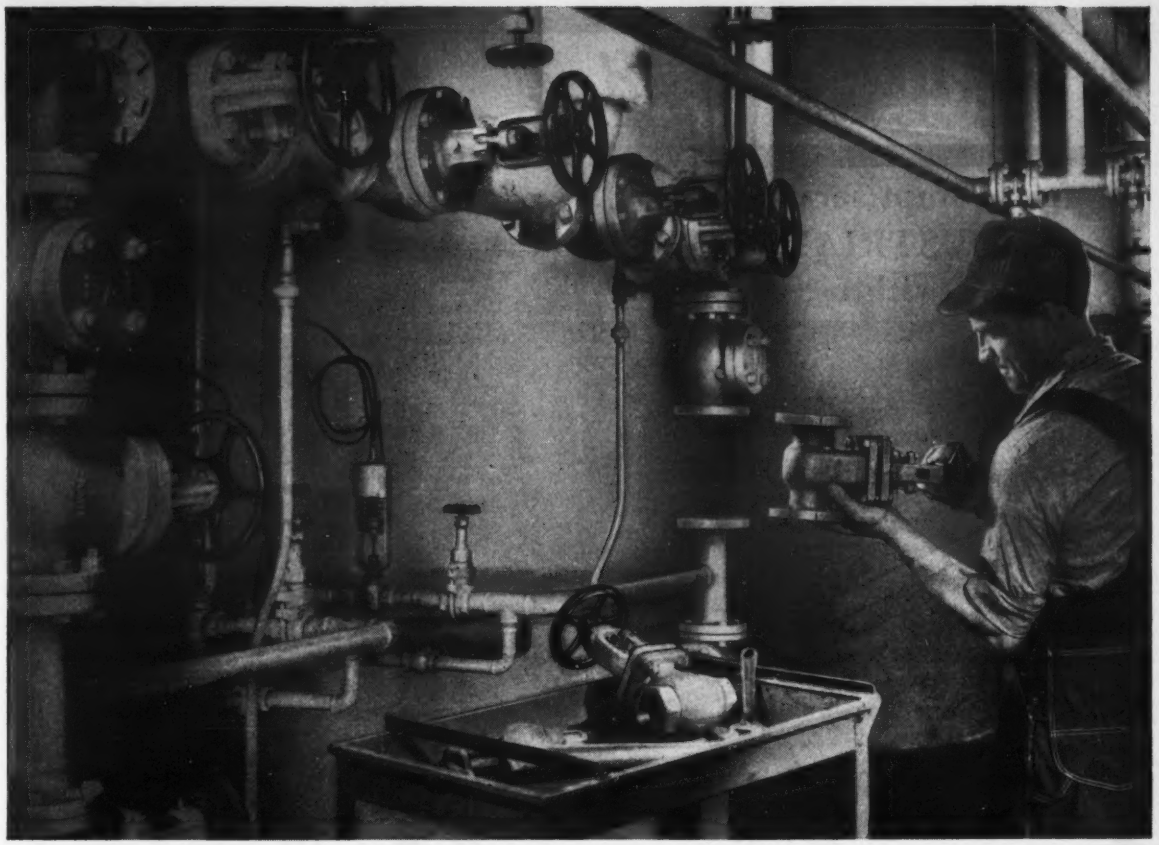
Packaged Turbo-Dryer for small production, pilot plant, and experimental drying operations is described in four-page folder. Diagram illustrates design of unit and explains how it is best used to advantage for drying sensitive, friable, and crystalline materials.

Bul 2504 is issued by Wyssmont Company, Inc., Dept. CP, 42-11 27th St., Long Island City 1, N.Y. When inquiring about manufacturer's product reader may simply check CP 5668 on form opposite last page.

Folder has color chips of stencil inks

Combination folder and color card describes line of stenciling inks sprayed from aerosol container. Six color chips—red, orange, blue, yellow, green, and aluminum—are included in the folder. Typical applications are pictured.

"Spray Your Stencils" is issued by Reynolds Ink, Inc., Dept. CP, 4500 Euclid Ave., Cleveland 3, Ohio. When inquiring about manufacturer's product, reader may simply check CP 5669 on form opposite last page.



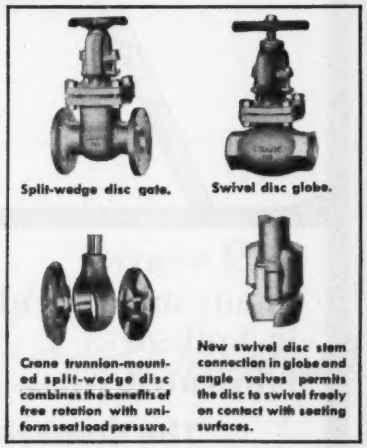
Corrosion meets match in Crane 18-8 SMo and Craneloy 20 valves

It's unanimous! These Crane valves for the process industries were *especially designed* of Crane alloys to cope with costly corrosion and to cut replacement costs.

The gate valves feature a simple, split-wedge disc construction which permits discs to rotate freely within guides and to seat tightly at all points on the seat perimeter. The free movement of the disc, plus uniform seating and unseating loads, minimizes galling and seizing, reduces wear and allows smooth operation under all conditions.

Globe and angle valves now feature a modified plug-type disc that combines the advantages of the easier seating of the narrow ball-to-flat seat and the high resistance of the wider plug-type disc to corrosion, erosion and cutting. In addition, these valves offer a new swivel disc-stem connection that seats the disc squarely every time. Minimum clearance eliminates vibration.

These valves are available in 18-8 SMo and Craneloy 20 . . . in gate, globe, angle and check patterns . . . ½" to 6" . . . screwed or flanged ends. Rated 150 p.s.i. at 500° F.—230 p.s.i. at 100° F. *For more detailed information*, confer with your CRANE representative or write to the address below for the 12-page circular AD-2080.


Split-wedge disc gate.
Swivel disc globe.
Crane trunnion-mounted split-wedge disc combines the benefits of free rotation with uniform seat load pressure.
New swivel disc stem connection in globe and angle valves permits the disc to swivel freely on contact with seating surfaces.

CRANE VALVES & FITTINGS

PIPE • KITCHENS • PLUMBING • HEATING

Since 1855—Crane Co., General Offices: Chicago 5, Ill. Branches and Wholesalers Serving All Areas

When inquiring check CP 5670 opposite last page

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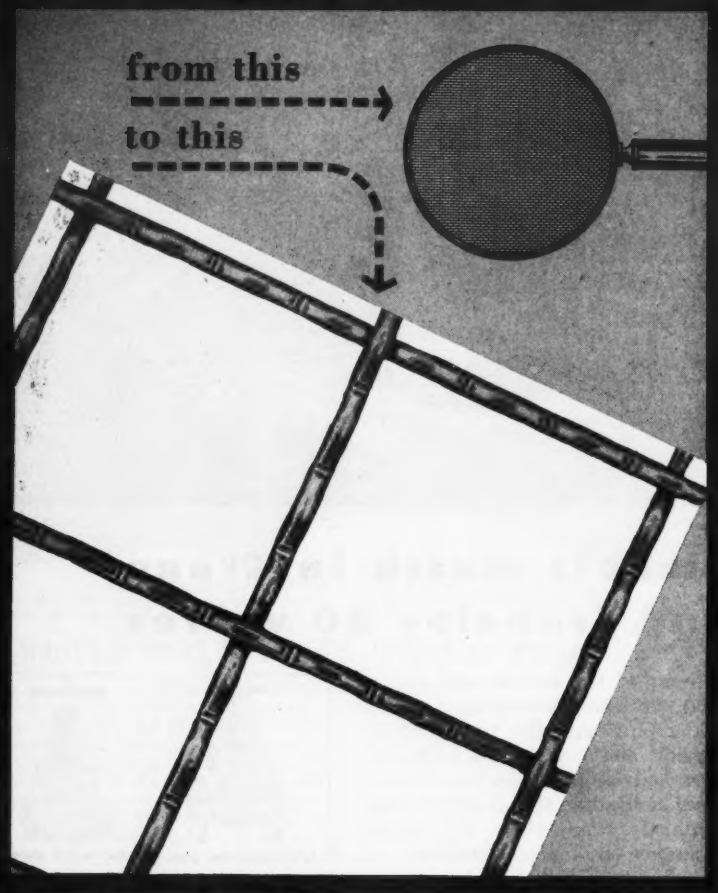

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When inquiring check CP 5671 opposite last page

NEW LITERATURE

Methyl n-propyl ketone subject of data sheet

Physical properties, specifications, shipping data, and applications are given for methyl n-propyl ketone in six-page technical-data bulletin. Topics covered include solubility of resins in various ketones, performance of various ketones in nitrocellulose lacquers, and a vapor pressure-temperature curve for methyl n-propyl ketone, as well as physiological properties of compound.

Bul F-8780 is available from Carbide and Carbon Chemicals Co., Div., Union Carbide and Carbon Corp., Dept. CP, 30 E. 42nd St., New York 17, N.Y. When inquiring specify CP 5672 opposite last page.

Shows conveyors for 160 tph

Two versions of mechanical vibrators rated for 160 tons per hour of dry sand are illustrated and described in single page data sheet. Lengths, required power, applications, and special features are covered.

"Dual Trough Conveyors" is issued by Syntron Company, Dept. CP, Box 220, Homer City, Pa. When inquiring specify CP 5673 on form opposite last page.

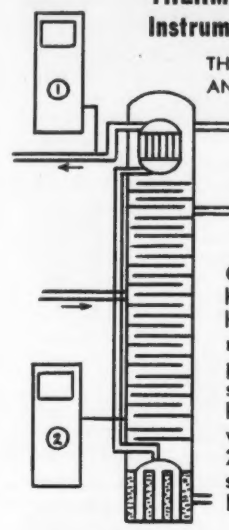
Presents advantages of insulated wire

Advantages of magnesia-insulated thermocouple wire in conductors for use in high temperature applications are presented in four-page, two-color bulletin. Complete instructions on attaching connectors and making thermocouple junctions are included.

Bul 4 is issued by Aero Research Instrument Co., Dept. CP, 1040 W. Grand Ave., Chicago 22, Ill. When inquiring specify CP 5674 on form opp. last page.

Thermco Analyzers for CHEMICAL PROCESS CONTROL

THERMCO IS READY to Instrument Gas Processes For You!



THERMCO HAS SUPPLIED IMPROVED ANALYZERS FOR THE FOLLOWING:

- Air Rectification
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Control by gas analysis may help you. By Thermco's know-how, gas analyzers have been made more practical by improved reliability, time lags and sensitivities. Thermco analyzers have full control over mixing valves in processes operating 24 hours a day. Complete instrument panels are available. Inquiries are welcome.

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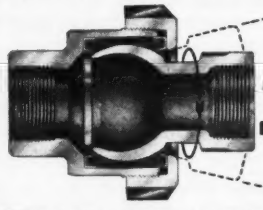
THERMCO LABORATORIES

When inquiring check CP 5675 opposite last page

BARCO *Flexible* BALL JOINTS

—when you need movable joints in piping handling



STEAM, OIL, CHEMICALS

Send for New Bulletin No. 2158

- Provides for movement in piping—up to 40° side flexibility, plus 360° rotating movement.
- Stainless steel and chemically inert gaskets for strong chemicals. No metal-to-metal contact. Choice of body materials.
- One Barco Ball Joint does the work of two or more ordinary swivel joints because "it moves in any direction!"
- Many models available. For pressures to 4,500 psi; temperatures to 1000°F. 15 different sizes. ¼" to 12". *Ask for recommendations.* BARCO MFG. CO., 537F Hough St., Barrington, Illinois.

THE ONLY TRULY COMPLETE LINE OF FLEXIBLE BALL, SWIVEL, SWING AND REVOLVING JOINTS

When inquiring check CP 5676 opposite last page

Details fire protection for special hazards

Describing methods for special hazard fire protection, 28-page booklet includes fire control and extinguishment chart on fire-fog, airfoam, high pressure and low pressure carbon dioxide, and dry chemicals. Fire protection involving fast-burning or explosive solids is discussed. Methods of detection are also covered.

"Special Hazard Fire Protection" is issued by "Automatic" Sprinkler Corporation of America, Dept. CP, Youngstown 1, Ohio. When inquiring check CP 5677 on form which is located opposite last page.

Tower throughput 3½ times greater with new packing material

New packing material which increases efficiency of distillation, absorption, scrubbing, and stripping towers is described in four-page bulletin. Use is reported to boost throughput 2 to 3½ times that of existing bubble tray or ring packed towers.

Bul "Spraypak" is issued by S. Blickman, Inc., Dept. CP, Wheehawken, N.J. When inquiring specify CP 5678 on form opposite last page.

"She claims to have had a difficult time socially, but understands that we have reducing agents up here"

The "neck" between the pump chamber and motor area of this new Chempump acts as a thermal barrier to the transfer of heat from the pumped fluid to the relatively cool fluid circulating in the rotor chamber. Further motor section cooling is achieved by the heat exchanger girdling the stator.

New *Chempump* handles hot fluids

- **No seals . . . no stuffing boxes**
- **No fluid loss or contamination**
- **No lubrication . . . 90% less maintenance**
- **Just one moving part**

Now you can pump heat-transfer fluids, hot vegetable and mineral oils, silicone fluids—without leakage . . . without contamination, even under extreme vacuum or pressure! This new Series T *Chempump* ends the problems of transferring or circulating such hot "problem" fluids as Dowtherm, Arochlor, fatty acids, vegetable oils or others.

Pump, motor and heat exchanger are combined in a single, compact hermetic package. Pump impeller and rotor are an integral unit—*Chempump's* only moving part.

Fluid enters the rotor chamber, and is completely isolated from the stator section by a corrosion-resistant, non-magnetic liner. A portion of this fluid is continually re-circulated in the rotor chamber and through an integral heat exchanger by an auxiliary impeller, to cool the motor. Pressure balance at the "neck" prevents intermixing of fluid in the motor section and fluid in the pumping section while the *Chempump* operates at a steady state. Motor windings keep cool, yet there's no heat loss of pumped fluid.

No shaft-sealing device is needed. Normally hard-to-handle fluids—hot, volatile, toxic, corrosive, explosive, radioactive—just can't leak or become contaminated.

Get the facts. For details and application data, send for new *Bulletin 1040.*

SPECIFICATIONS

Horsepowers	¾ to 7½, in 6 models
Heads	to 190 feet (maximum)
Capacity	to 200 GPM (maximum)
Materials of construction*	cast iron, cast steel, 300-series stainless steel
Temperature limit*	1000°F.
Pressure limit*	150 psi

**Standard. Designs for higher temperatures or pressures, or using other construction materials, available on special order.*

Chempump

First in the field . . . process proved

CHEMPUMP CORPORATION • 1300 E. Mermaid Lane • Phila. 18, Pa.

When inquiring check CP 5679 opposite last page

Pumping Progress Report

FOR CHEMICAL ENGINEERS

An advertisement prepared by The Aldrich Pump Co., Member of Hydraulic Institute, U.S.A.

SPACE, in many pump installations, is a major problem. Another is the necessity for special foundations. For new installations these factors may dictate elaborate construction; for replacement or modifications of existing systems, expensive piping and equipment changes.

COMPACTNESS OF DESIGN, while often desirable, is not necessarily the answer. Simplicity of design may be a better solution.

SIMPLICITY OF DESIGN brought about the first Inverted Triplex and Quintuplex and ultimately Septuplex and Nonuplex Pumps. This Aldrich design innovation brought to users economies of space, maintenance and operation they had never known. And even more important, Multiplex pumps brought new freedom from pulsation.

INVERTED PUMP DESIGN permits the use of less expensive foundations. With the crankshaft located near the floor there is no need to raise the driver or lower the pump. Then, too, inverted pumps require fewer square feet of floor space than conventional pumps.

MAINTENANCE COSTS ARE REDUCED. Fluid-end, where most work is done, is at chest level. Sectionalization, another Aldrich innovation, and parts standardization permit ease and economy of inspection or replacement.

TELL US ABOUT YOUR PUMPING PROBLEM. The chances are that one of our standard pumps — or a modification — will do your job. Detail your problem and we'll send you our Data Sheet describing the Direct Flow Pump we recommend. Write to: The Aldrich Pump Company, 23 Gordon Street, Allentown, Pa.

When inquiring check CP 5680 opposite last page

NEW LITERATURE

Preparing preformed bags from PVA films shown

How polyvinyl alcohol film is used in preparing preformed bags is shown by means of photographs and drawings in 4-page folder. Blanket-vacuum bag, pressure bag, and autoclave molding are treated. Advantages of PVA film in forming reinforced plastics are enumerated. Properties and characteristics of company's mold release parting solution are also listed.

Form P-102 is available from Plastics Div., Reynolds Metals Co., Dept. CP, 3840 Georgia St., Gary, Ind. When inquiring specify CP 5681 on form opposite last page.

Industrial applications of bronzes

Engineering properties and industrial applications of five bronzes, which offer superior service in uses covered, are described in 26-page bulletin. These Ni-Vee alloys contain 5% nickel, 5% tin, and varying amounts of lead.

Bul 3157 is issued by The International Nickel Co., Inc., Dept. CP, 67 Wall St., New York 5, N.Y. When inquiring specify CP 5682 on form opposite last page.

Data and specifications on fatty acid esters

Fatty acid esters of glycerol, glycols, and polyethylene glycols are covered in 24-page catalog. These nonionic surface-active agents find wide use as emulsifiers, stabilizers, penetrants, thickeners, defoamers, and plasticizers. The bulletin gives specs, solubilities, and detailed description of the 44 products.

"Esters by Glyco" is issued by Glyco Products Co., Inc., Dept. CP, Empire State Bldg., New York 1, N.Y. When inquiring specify CP 5683 opp. last page.

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Specializing in the non-ferrous metals
in counts to 200 x 200 or 50 x 750
and widths up to 48" in all commercial weaves

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THE C. O. JELLIFF MFG. CORP.
SOUTHPORT • CONNECTICUT • USA

When inquiring check CP 5684 opposite last page

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STRAIGHT THROUGH

Diaphragm Valves

UNRESTRICTED FLOW
MINIMUM PRESSURE DROP
MAXIMUM DIAPHRAGM LIFE

★ No dam to trap fluids and suspended matter; self-draining.
★ Unrestricted Flow—minimum pressure drop.
★ Exclusive Diaphragm Design—minimum flexing—no danger of overclosure.
★ Widest range of lining, diaphragm and body materials.
★ Lower first cost.

For handling:—
Slurries, corrosive and abrasive suspensions, pulps, sludges, gases, sewage, latex, semi-fluid foods, water, acids, alkalis, and most hard-to-handle fluids.

Write today for PROOF of these statements—*compare* and you'll specify Wynn *Straight Through* Diaphragm Valves.

Send me bulletin and complete details on Wynn Straight Through Diaphragm Valves.

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STOCKDALE ENGINEERING COMPANY
P. O. BOX 144, HADDONFIELD, N. J.

When inquiring check CP 5685 opposite last page

Facts about titanium

Folder on titanium contains a list of the commonly available titanium alloys and their compositions, forming and welding methods, heat treatment and machining information, as well as other pertinent data. A brief comparison of titanium properties with those of stainless steel and aluminum alloy is also included.

"Facts about Titanium" is issued by Arthur D. Little, Inc., Dept. CP, 30 Memorial Drive, Cambridge 42, Mass. When inquiring specify CP 5686 on form opposite last page.

Catalogs automatic controls using mercury switches

Booklet of 52 pages describes manufacturer's automatic controls equipped with mercury switches. Specifications are given for each control, including electrical ratings, standard features, and prices. Controls are described for everything from ammonia pressure to zone controllers for damper mortars.

Cat 856 is issued by The Mercoid Corp., 4201 Belmont Ave., Chicago 41, Ill. When inquiring specify CP 5687 on form which is located opposite last page.

How light is controlled by louver panels

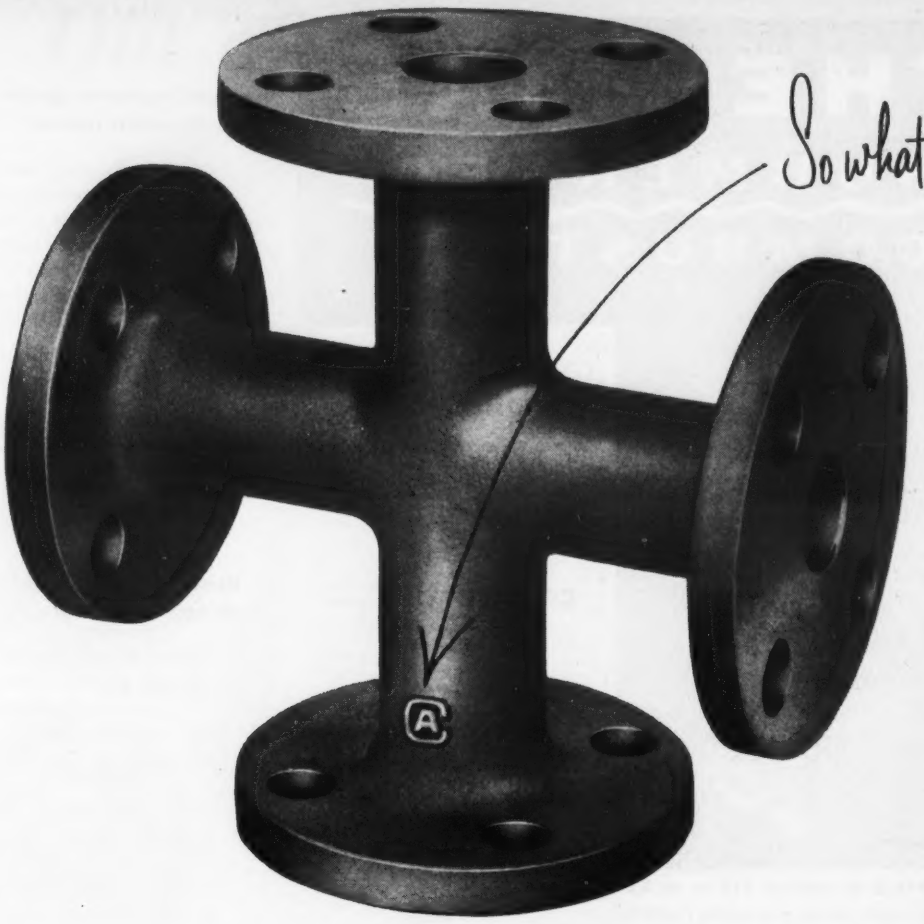
How daylight louver panels are used to control amount of light entering a building is illustrated in 18-page booklet. Sizes to use, installation details, and suggested specifications are given.

Bul PL-226-a is issued by Rohm & Haas Co., Dept. CP, Washington Square, Philadelphia 5, Pa. When inquiring specify CP 5688 on form opposite last page.

Describes uses for asphaltic protective coating

Durable protective coating for thermal insulation in refineries, chemical plants, power stations, and other plants is described in eight-page bulletin. Product, which is cold-applied, is compounded from selected asphalts. It has a high resistance to moisture.

Bul B-26 is issued by American Bitumuls & Asphalt Co., Dept. CP, 200 Bush St., San Francisco, Calif. When inquiring specify CP 5689 on form opposite last page.



There's a good reason for the Ⓐ trademark on our

STAINLESS STEEL FITTINGS

Behind the Cooper Alloy trademark stands more than *a quarter century of experience* in the manufacture of stainless steel fittings...and every year of this experience is reflected in completeness of line, soundness of design, quality of workmanship and availability of the product.

Regularly stocked in types 304, 316, 347 and FA20, and available on short delivery in the extra low carbon (ELC) grades as well as in nickel or monel, the Cooper Alloy line is sold and serviced by industrial distributors, mill supply houses and piping distributors with branches and warehouses in key cities. Backed up by a network of regional representatives, sales engineers and the most intensive continuing research program in the industry, these distributors offer maximum service and fast delivery.

Every step in production, from the original design through the patternmaking, coremaking, molding, melting, heat treatment, pickling, machining, testing and shipping is under the direct control of Cooper Alloy stainless steel specialists. Look for the CA trademark before you buy . . . It's a sign of quality, experience and reliability.

Catalog 55F available on request.

COOPER ALLOY CORPORATION
Valve and Fitting Division • HILLSIDE, N. J.

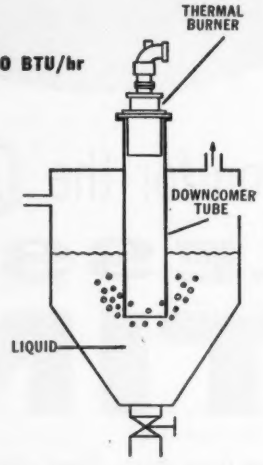
When inquiring check CP 5690 opposite last page

THERMAL
SUBMERGED COMBUSTION

simplicity of design and construction... *plus* extreme compactness

HEAT INPUTS OF 250,000 BTU/hr to 5,000,000 BTU/hr

The high heat release rate of the THERMAL High Velocity burner used in these submerged combustion installations allows the use of a simple downcomer tube through which the products of combustion are discharged beneath the surface of the liquid. This arrangement is possible because combustion is 90% completed within the burner proper. The THERMAL burner is completely separate from the liquid being heated and maintenance, control and accessibility are greatly simplified. Equally simple arrangements are possible with gas, oil or combination fuel.



BROAD RANGE OF APPLICATIONS

Depending upon the material being heated either a metal or refractory downcomer tube may be used. Some of the more common applications are pickling baths, acid concentration, caustic soda concentration, aluminum sulphate concentration, water recarbonization, and glass frit and molten salt heating.

WRITE FOR BULLETIN #110

OTHER THERMAL PRODUCTS & SERVICES → Gas, Oil & Combination Burners • Air Heaters • Combustion & Heat Transfer Equipment

THERMAL
Thermal Research & Engineering Corp.
CONSHOHOCKEN • PENNSYLVANIA
REPRESENTATIVES IN PRINCIPAL CITIES

When inquiring check CP 5691 opposite last page

NEW LITERATURE

Plant engineers guide to vibration control

Illustrated engineers' guide gives suggestions for machinery mounting and vibration and noise control. Pictured is company's line of mountings with photographs of actual installations.

Bul K6A is available from The Korfund Company Inc., Dept. CP, 48-15 32nd Place, Long Island City 1, N.Y. When inquiring specify CP 5692 on form opposite last page.

Reactions and properties of epichlorhydrin

Technical information bulletin of eight pages containing physical properties, applications, typical reactions, and physiological properties of epichlorhydrin is now available. Bibliography lists twenty references. Compound is used in epoxy resins, ion exchange resins, surface active agents, pharmaceuticals, and dyestuffs.

Bul F-8862 is available from Carbide and Carbon Chemicals Co., Div. of Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, N.Y. When inquiring specify CP 5693 on form opposite last page.

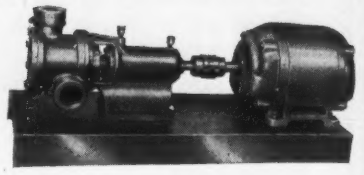
Bearing selection in chart form

Selection and application of commonly used thrust bearings for large vertical AC motors are presented in chart form. Thrust capacity, speeds, lubrication, cooling, and advantages and limitations of various bearings are considered.

"Selection Chart" for thrust bearings is available from Electric Machinery Mfg. Co., Dept. CP, 800 Central Ave., Minneapolis 13, Minn. When inquiring specify CP 5694 on the convenient Reader Service slip opposite last page.

by PROGRESS *out of* NECESSITY

The **NEW!** **APCO Z4** *Process* **PUMPS**



for **HANDLING LIQUEFIED PETROLEUM GASES, REFRIGERANTS** ***and other*** **NON VISCOUS LIQUIDS** ***of*** **MODERN INDUSTRY**

Modern industry offers a challenge in the form of new and difficult applications which demand improved pumping techniques. In the Type Z4 APCO Turbine-Type Pumps will be found the complete answer to many of the applications involving liquefied gases and other light, non-viscous liquids. Obtainable in special metals with notable economy.

Write for **BULLETIN 111-ZA**

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AURORA PUMP DIVISION
THE NEW YORK AIR BRAKE COMPANY
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When inquiring check CP 5695 opposite last page

alphabetical index on page 234

. . . for alphabetical index of all processes, materials, services, and equipment discussed in this issue's editorial columns and advertisements, turn to page 234. "Quick-locator" starting on that page was a feature in CHEMICAL PROCESSING years ago. It means extra work for the Editors, but it helps you, the reader, in finding what you want . . . in a hurry!

Piping flexibility analysis subject of brochure

General analytical method of piping flexibility analysis for evaluating stresses, reactions, and deflections in complex piping networks is the subject of eight-page brochure. A typical piping stress problem, solved by both general analytical method and model test, is included. Company's piping model test and electronic computing facilities are described.

"Piping Flexibility Analysis" is available from The M. W. Kellogg Company, Subs. of Pullman Incorporated, Dept. CP, 225 Broadway, New York 7, N.Y. When inquiring specify CP 5696 on form opposite last page.

Contains four case studies on conveyor systems

Booklet of 22 pages contains four case studies on use of manufacturer's conveyor systems in warehousing case products. Conveyor system is gravity flow. Booklet includes section on accessories available from manufacturer for conveyors.

"Controlled Flow" is issued by The Rapids-Standard Co., Inc., 342 Rapistan Building, Grand Rapids 2, Mich. When inquiring specify CP 5697 on form opposite last page.

Technical data on tantalum for sulfuric acid

High resistance of tantalum to corrosion by sulfuric acid is illustrated in technical data on corrosion loss of metal in 98% sulfuric acid and fuming sulfuric.

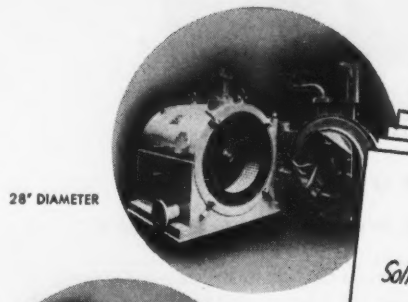
Bul 2.706 is issued by Fansteel Metallurgical Corp., Dept. CP, North Chicago, Ill. When inquiring specify CP 5698 on form opp. last page.

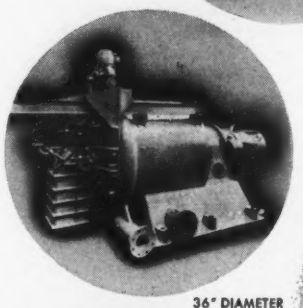
A short history of bottles

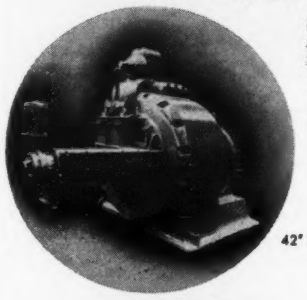
Attractively printed and illustrated 32-page, pocket-size booklet gives a concise history of glass bottles from antiquity to the present. Interesting reading in its own right, it provides a background to glass developments now making themselves felt. Some statistics on present production and consumption are included also.

"History of Glass Containers" is issued by Glass Container Manufacturers Institute, Inc., Dept. CP, 99 Park Ave., New York 16, N. Y. When inquiring specify CP 5699 on form which is located opposite last page.

Out of the Engineer's Workbook...


28" DIAMETER


36" DIAMETER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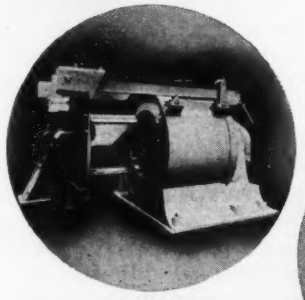
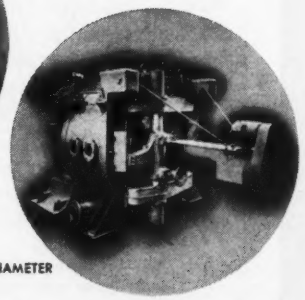
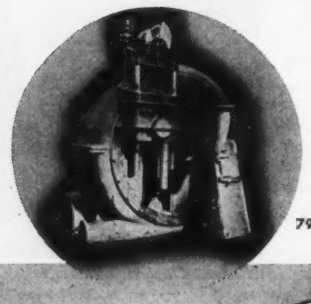
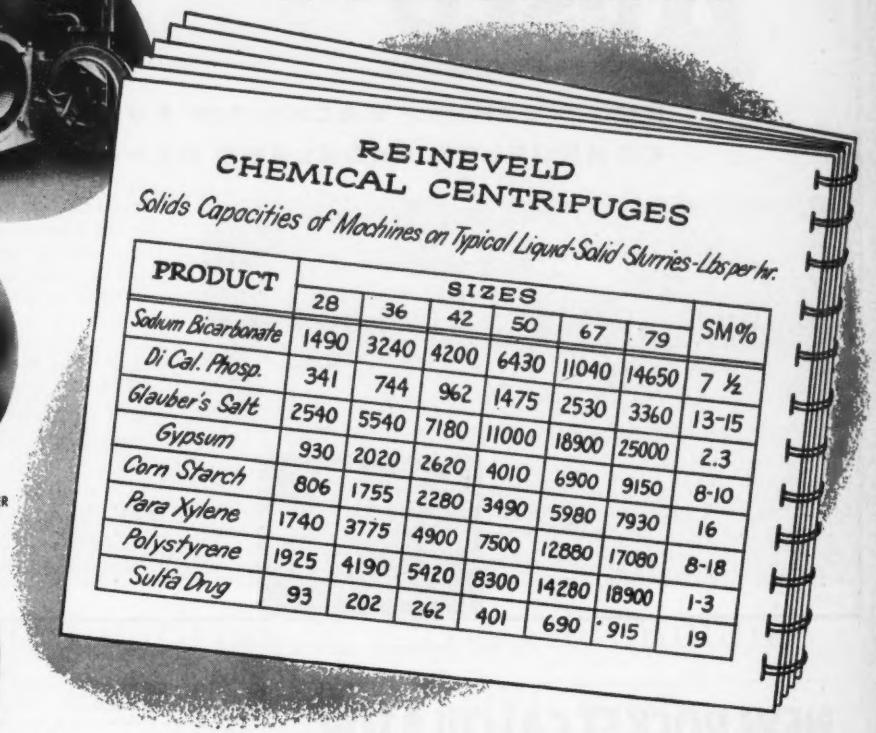

50" DIAMETER


67" DIAMETER


79" DIAMETER



This table is illustrative of capacities and surface moistures obtained from the Reineveld Centrifuge. It is only a fragment of the complete information for your dewatering problems . . . now available from Heyl & Patterson engineers.

Phone or write for a copy of the new Reineveld Brochure RC-356.

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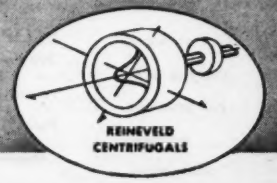

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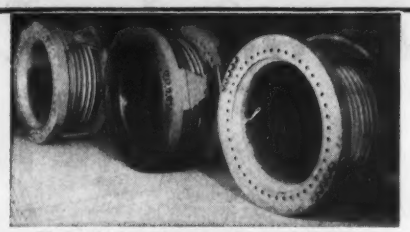
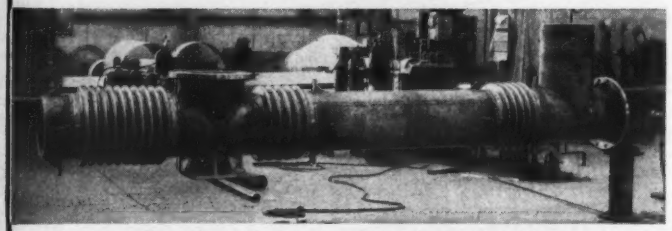


Three 48" Hinge-Type Corruflex Expansion Joints

ENGINEERING BACKS UP EVERY CORRUFLEX PACKLESS EXPANSION JOINT

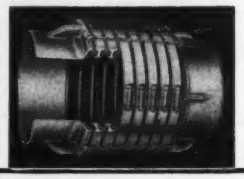


Complex stainless steel assembly of piping and joints absorbing four different motions

Regardless of size or degree of complexity of the joint involved, ADSCO applies its vast engineering experience to every piping problem presented to it. The help ADSCO provides not only makes the customer's piping react the way it should but also saves money in both installation and maintenance costs. Next time consult ADSCO, a leader in the development of maintenance-free packless expansion joints.

● *Write for Bulletin 35-51.*

Basic Corruflex Joint with Equalizing Rings



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"What's A New Solution"?

It's an article in CHEMICAL PROCESSING describing a new way of solving a tough plant operating problem. In each issue you will find specific "case histories" showing how these processing problems were solved. Each article states the operating problem . . . explains the process used and gives details of how problem was solved . . . shows results secured.

Take a look at "New Solutions" articles in this issue — they might suggest a "solution" for some of your tough processing problems.

NEW LITERATURE

How additives improve galvanizing

Method which controls galvanizing so that the zinc is deposited evenly is described in four-page bulletin. Process is accomplished by the use of a series of additives and a technique developed by manufacturer. Technique provides controlled etching without danger of over pickling and furnishes an oxide-free surface when piece enters flux.

"Controlled Protection" is issued by Promat Div., Poor and Company, Dept. CP, 851 S. Market St., Waukegan, Ill. When inquiring specify CP 5703 on form opposite last page.

Improved pump design subject of brochure

Four-page illustrated folder covers improved design of single-stage, single-suction centrifugal pump fabricated from aluminum bronze. Specific applications are illustrated and a table of comparative corrosion rates for various metals is given.

Bul P-3b is issued by Ampco Metal, Inc., Dept. CP, 1745 S. 38th St., Milwaukee 46, Wis. When inquiring specify CP 5704 on form which is located opposite last page.

Credit Robert Delezenne for this cartoon. Bob is chemical analyst in the control lab of the Port Huron (Michigan) plant of Peerless Cement Corporation. This is his first published cartoon, but more are coming.

Concern for Cost

(*Continued from page 7*)

telephone and telegraph, hiring of outside professional services, overtime pay, and supplies and postage. Savings effected in these areas did not in themselves represent a large sum, but they furnished a common ground on which committee members could meet — and helped create an actual behavioral change. By working together in these areas, a common cost-concern *attitude* was developed which spread naturally to the individual's own specific area of operation.

Suggestions began to sift in from many sources. One supervisory group noted that the company spent hundreds of dollars annually on parcel post insurance for a $2 item. The company stopped insuring the item, and in one year suffered only one $2 loss.

Another group suggested that telephone slips be returned to the long distance caller to remind him of the cost of his call. These slips showed the telephone rate in comparison with telegraph night rates. Within a short time, telephone costs were reduced.

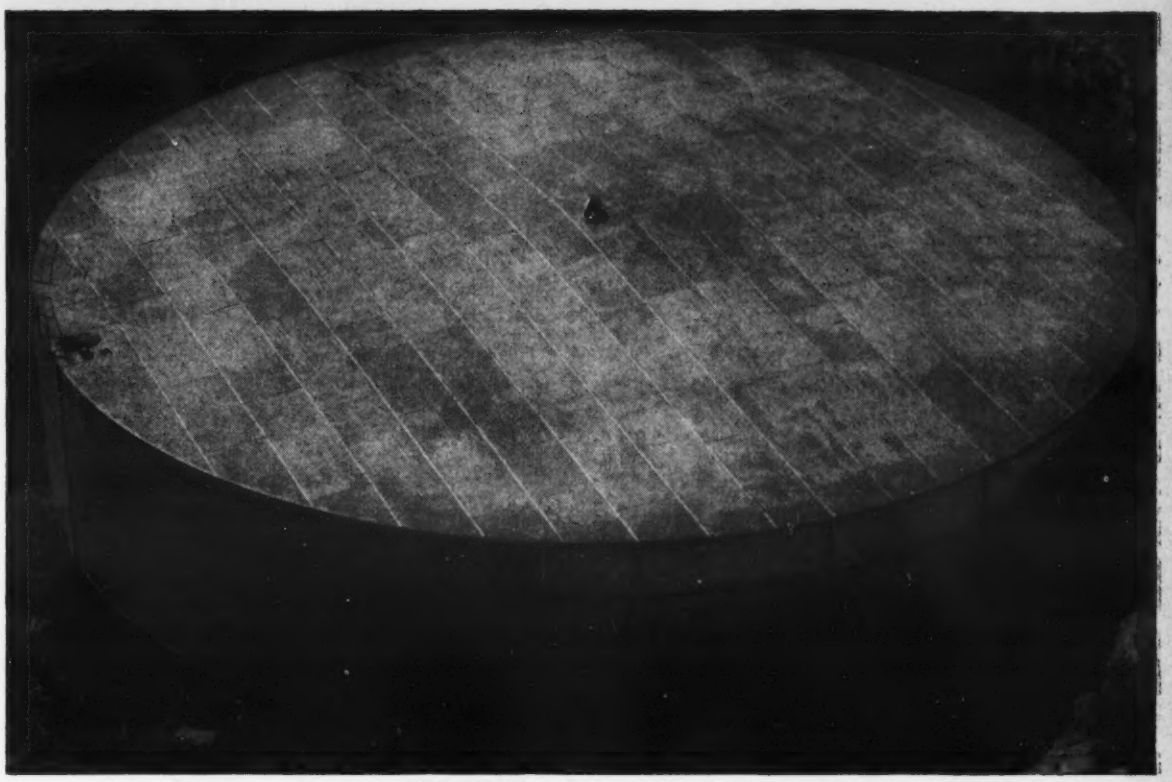
The company's methods of handling its mail and parcels came under close scrutiny after another employe volunteered to go to a special post office school to learn the latest and most efficient postal techniques. Considerable savings were achieved in this area, too.

After a year and a half of such effort, Ansul found that its cost budget realization was at 100 per cent despite the payment of an additional $40,000 in wages and salaries and other cost increases in raw materials. Profits after taxes increased by 40 per cent and company stock appreciated by 30 per cent over the previous fiscal period. Latter achievements were all the more remarkable because they were accomplished during a period when sales were showing a 9 per cent decrease.

In addition to these specific gains, we found that there were a number of other intangible benefits from the program. For one thing, it made the company's participative management philisophy more understandable to all management levels and to employes. Also, it provided a successful situational training program for all personnel involved.

Finally, there were still other areas to which the cost concern program led Ansul — areas which, at the start of the program, the company did not expect to explore. For example, the cost concern program led the groups to a series of meeting clinics to improve effectiveness of management meetings and to reduce the time spent in meetings. It also led to a "betterment and improvement" program leading toward a more effective program of expenditure of Ansul's capital assets money.

To summarize, our overall experience with cost concern supports the basic underlying theme of participative management — that people support what they help create.



Constructed entirely of Alcoa Aluminum, world's largest all-aluminum tank* stores 2⅓ million gallons of ammonium nitrate

High resistance to the corrosive action of ammonium nitrate was a big factor in choosing ALCOA Aluminum for the world's largest all-aluminum storage tank. The Mississippi River Chemical Company's primary consideration in erecting the giant tank was the need for uninterrupted storage service with a minimum of maintenance. ALCOA Aluminum's natural resistance to weathering and ammonium nitrate corrosion assured the company of long service with low maintenance costs.

ALCOA Aluminum is used extensively throughout the chemical and petroleum industries to handle many corrosive solutions. This economical metal has a proven record of long, trouble-free service in tank cars, piping, drums, prilling towers and storage tanks.

Write today for detailed information on how ALCOA Aluminum can be used effectively in your operation. Take advantage of ALCOA's more than 30 years of experience with aluminum in hundreds of applications. Send for the new, 80-page book, *Process Industries Applications of Alcoa Aluminum.* It contains the latest performance and design data on ALCOA Aluminum. Write on your company letterhead or use the coupon.

* World's largest all-aluminum storage tank at the Selma, Missouri, plant of Mississippi River Chemical Company. The tank stands 26 feet high, has a diameter of 128 feet, is constructed of more than 300,000 pounds of Alcoa Aluminum, holds 2⅓ million gallons of 83% ammonium nitrate solution. Field erected by Chicago Bridge & Iron Company, Chicago, Illinois. Designed by Fluor Corporation, Ltd., Los Angeles, California.

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Discussed in this issue—

PROCESSES, EQUIPMENT *and* MATERIALS

Use this "quick-locator" when you want information on a specific type of process, equipment or material mentioned in the processing stories or the advertisements in this magazine. Everything discussed in this issue is given here, if you want more data you can write manufacturer direct . . . or turn to inside back cover and use the convenient "Information Request Slip." This is a special service provided by the publisher . . . no obligation or charge, of course. The publisher contacts the proper manufacturers for you—information comes to you direct.

A

Absorbers, HCl 182
Acetone 36
Adaptors 136
Agitators, Pneumatic 232
Agricultural Chemicals 49
Air Conditioning Systems .. 70
Airlocks, Rotary 205
Alloys, Master 59
  Nickel-copper 110
Alkane 35
Aluminum 233
Aluminum Conditioner 38
Aluminum Electrical Enclosures 104
Aminomethylpropanol 49
Ammonia 56
Ammonia Plants 68
Analytical Chemistry 137
Anaylzers, Gas 148, 226
  Infrared 84, 147
  TEL 30
Aniline 39
Antistatic Agents 52
Attachments, Fork Truck 131
Autotransformers 98

B

Bactericide 214
Bag Closing Machine 176
Bags, Multiwall 174, 178
  Plastic 240
Bags & Sacks 132
Balances, Trip 152
Balls, Ceramic 195
Barrels 177
Baths, Temperature 152
Battery, Silver-cadmium 103
Bearing, Thrust 230
Bellows, Teflon 8
Bins, Pulsating Panel 204
Bisphenol A 58
Biochemicals 61
Blast Grit 109
Blenders, Dry-batch 157
Blowers 194
  Corrosion-resistant 236
  Plastic Exhaust 208
Boilers 213
  Low-pressure Heating 223
  Packaged 206
Borescopes 154
Boron, Amorphous Elemental 58
Bottles 231
  Throw-away 156
Boxes, Carboy 126
  Corrugated 219
  Corrugated & Fiber 132
Bronzes 228
Bulk Material Handling Equipment 130-131
Burners, High-velocity 230

C

Cable, Cathodic Protection .. 212
Calculators, Batch-mixing 232
Cans, Metal 176
  Safety 240
Cappers 177
Carbon, Activated 34, 41
  Granular 61
Career Opportunities 156
Cartons, Folding 132
Cartoons, Safety 144
Castings, Nickel 243
Caustic Soda 44
Cements, Corrosion-proof 116
  Thermal Conducting 191
Centrifugals, Continuous 165
Centrifuges, Chemical 231
  Dehydrating 72
Chains 121
  Aluminum 148
  Roller 74
Charcoal, Activated 49
Chemical Materials, Industrial 36
Chemicals, Agricultural 50
  Fluoro 59
  High-purity 74
  Industrial 50, 59, 212
  Organic 52
Chromium Diffusion Processes 29
Chromium Impregnation 107
Cloth, Wire 226
Coatings, Asphaltic 229
  Bituminous 113
  Corrosion-resistant 196
  Neoprene 118
  Floor 106
  Protective .. 112, 114, 116, 119
  Vinyl Mastic ..... 4th Cover
Coconut Oil 52
Collectors, Fly Ash 149
Columns, Solvent-extraction .. 166
Compressors 68
  Portable 192
  Rotary 235
Computers 99
Condensers, Air-cooled 190
Condensing Systems 171
Containers, Lined-steel 129
  Steel 175, 234
Control Boards 164
Control Systems 90, 99
Controller Renewal Parts 214
Controllers 32-33, 102-103
  Conductivity 89
  Electronic & Pneumatic 96-97
  Flow 157
  Level 82, 92
  Liquid-level .. 90, 100, 212, 237
  Motor 143
  Pressure 84-85
  Temperature 93, 213
  Temperature, Humidity & Pressure 95
  Time 100
Conveyor Belts, Metal 226
Conveyor Systems 231
Conveyors 126, 157
  Air 128
  Booster 132
  Oscillating 135
  Screw 191
  Tubular 122, 187
  Vibrating 226
Coolers, Cascade 182
  Water 208
Coolers & Clarifiers 187
Cooling Systems 171
Cooling Towers 18
Corrosion Coatings 106
Corrosion-proofing Materials 212
Counters, High-speed 89
Couplings, Flexible 8, 188
  Fluid 25
  Hose 217
  Quick-seal 62, 208
Crushers 157
  Impact 164
Cyclones 149
Cylinders 194
  Gas 188
  Hydraulic 65

D

Data, Chemical Reference .. 137
Decolorizing Sugar 34
Deflashing Machine, Plastics 165
Defoamers 36
  Silicone 54
Dehumidifiers, Sprayed-coil .. 200
Detergent Material 35
Dehydrators 72
Desticizers 48
Detectors, Fire 146
Diaphragms, Convolute 211
Diethanolamides 39
Digesters, Pulp 19
Diisocyanates, Aromatic 45
Disintegrators 166
Dispensers, Oil-absorbent 145
Dispersants 60
Dissolvers 183
Distillation 136
Dithiooxamide 37
Dockboards 128
Drives, Variable-speed 32-33
  Tube-expander 187
Drum Handling Equipment .. 164
Drum Rotators 172
  Portable 164
Drums 175
  Acid 177
  Fiber 179
Drum & Barrel Sling 120
Drum & Barrel Tilt 120
Dust Collectors 70, 188
Dryers 21, 155, 225
  Compressed-gas 166
  Fluid-bed 12
  Glass-lined Conical 163
  Vacuum 154
Drying Systems 161, 170

E

Ejectors, Steam 212
Elbows, Long Tangent 24
Elevators, Drum 128
Emulsifiers 49
Enamels, Gloss 46
Engineering, Plant 166
Engineering & Design 172
Epichlorhydrin 230
Ether, Anhydrous 51
Ethylene Glycol 51
Evaporators 168
  Multiple-effect 172
  Sea Water 81
Exhausters, Power Roof 148
Exhaust Systems 116
Expansion Joints 136, 232

F

Fabrication, Metal 215, 226
  Plastic 113
  Process Equipment 23, 215
Fans 118
  Industrial 192
  Ventilation 140
Fatty Acid Esters 228
Fatty Acids 40, 52, 56
  Polymerized 54
Feed Additives 50
Feeders, Continuous 90-91
Fillers, Auger 178
Filling Heads, Aerosol 174
Film, Plastic 203
  PVA 228
Filter Aids 80-81
Filter Fabrics, Non-woven .. 26
Filter Materials 173
Filter Paper 192
  Neoprene 170
Filter Presses 167
Filters 7, 187, 224, 236
  Laboratory 152
  Leaf 164
  Self-priming 112
  Self-cleaning Tubular 168
  Tubular 162
  Vacuum & Pressure 75
Filters & Lubricators, Air Line 92
Firebrick, Insulating 66
Fire Protection 141, 227
Fittings 73, 186
  Corrosion-resistant 3
  Forged Steel 137
  Nickel 224
  Nickel-plated 146
  Plastic-lined 117
  Pneumatic 132
  Pneumatic-handling 134
  Quick-connect 193
  Stainless 229
Fittings & Flanges 9
Floor Patch & Resurfacer 242
Floor Resurfacer 197
Floor Surfacing, Corrosion-proof 105
Flow Calculations 91
Flow Theory 88
Fluorocarbon Plastics 106
Food Irradiation 77
Formaldehyde 57
Freon 16
Fungicides 214
Furnaces 160

G

Gage Glasses 159
Gages 94, 139, 213
  Liquid 98
  Liquid-level 93
  Safety Pressure 143
Galvanizing 232
Gas Analyzers, Differential .. 82
Gaskets 224
  Jacketed 136
  Snap-on 136
  Spiral-wound 20
Generators, Gas 144
  Steam & Hot Water 168
Glass Fibers 44
Glassware, Industrial 159
  Laboratory 153
Gloves, Coated 144
  Industrial 70, 128, 142
Governors, Mechanical & Hydraulic 18-19
Graders 162
Granulators 157
Grating, Metal 200
  Steel 134
Grease Making 56
Grinders 157
  Mortar 156
Grout, Pre-mixed 200

H

Hardener for Epoxides 50
Hardeners, Epoxy 39
Heat Exchange Equipment .. 196
Heat Exchanger Fabrication .. 197
Heat Exchangers 10, 111, 113, 191
  Electric 170
  Glass Shell & Tube 116
  Graphite 182
  Scraped-surface 64
Heaters, Bayonet 182
  Electric 170
  Plate 182
Heating Equipment, Process 240
Heating Mantles, Electric 151
Heating Systems, Hot Oil 190
Heating Units 165
Heat-transfer Equipment 230
Hexamethylenetetramine 53
Hose 221
  Flexible Metal 62, 118
  High-pressure 202
  Oil & Chemical-resistant .. 110
Hose Assemblies 217
Hydraulic Cylinders 65
Hydraulic Fluids 145
Hydraulic Systems 203
Hydroabietyl Alcohol 46
Hydrogen Peroxide 47

I

Indicators, Liquid 154
  Liquid Level 144
  Ultrasonics Generator Output 74
Industrial Drying Equipment 155
Inks, Stencil 225
Inspection Devices 154
Insulation, Castable 76-77
  Cellular Glass 193
  Glass-fiber Tank 78
  High-temperature 201

Jacketed Pipe 108
Spun Mineral Wool 239
Iodine Sources 56
Iodophors 56
Ion Exchangers 158
Iron Phosphates 59
Irrigation Systems 79
Isopropyl Ether 25

J

Jar Rolling Machines 153
Joint Compound 210
Joints, Ball 226
Expansion 209
Flexible 73
Rotary 210
Rotary Pressure 194
Teflon-lined Expansion 8

K

Ketones, Methyl n-Propyl 226
Kettles, Corrosion-resistant .. 74
Jacketed 111

L

Laboratory Facilities 18
Ladders, Safety 146
Lamps, Spectral 157
Lifts, Drum 126
Lighting, Emergency 215
Lights, Indicator 97
Liners, Plastic Drum & Carton 240
Lining Brick 148
Lithium Hydroxide Monohydrate 60
Loaders, Truck 129
Loading Arms, Barge 27
Lubricants 53
Acid-and-base-resistant 192
MoS_2 119
Oil 195
Synthetic 145

M

Machined Components, Graphite 182
Magnets 79, 133
Non-electric 202
Mass Transfer Operations 139
Mesh, Contour Retainer 198
Metal Fabrications 165
Metal Grating 122
Metal Hose, Flexible 225
Metal Treatment 116
Metal-treating Chemicals 109
Metallic Coatings 119
Metallizing 117
Meters, Electrical 103, 210
Flow 138
Fluid 241
Industrial Liquid 89
Liquid 210
pH 98
Pressure 83
Methanol 56
Methyl Esters 52
Mills 183
Ball & Pebble 153
Impact 167
Jar 153, 191
Mixers 169, 212, 236
Muller-type 27
Portable 152
Rotary Batch 167
Molybdenum Silicides 212
Monitors, Fire 142
Indicating 102
Mortars 156
Motor Starters ..... Opp. 27, 143
Motors ..... Opp. 26, 32-33
Oscillating Torque 188
Sealed 107
Totally-enclosed 29
Myristic Acid 52

N

Naphthenic Acid 51
Nitrocellulose 36
Nitroparaffins 214
Nomographs, Cooler 222
Paper pulp 218, 220
Scale 216
Nuclear Reactors 80
Nuclear Research 75
Nylon Dispersions 36

O

Odor Control 46
Odor Masking Agents 58
Oven Sections, Infrared 176
Ovens 158

P

Package Engineering 179
Packaging, Steel 175
Packings 144
Porcelain Tower 202
Pump 203
Teflon Ring 186
Teflon Yarn 211
Tower 227
Pails, Acid 107
Pails & Drums, Steel 234
Paints, Protective 200
Panels, Connector 138
Plastic 229
Pans, Cooling & Vacuum 74
Paraffins, Chlorinated 224
Pestles 156
Petrolatums 41
Petroleum Acids and Bases .. 136
Petroleum Sulfonates 41
Photometers, X-ray 150
Phthalic Anhydride, Molten 43
Pilot Plant Practices 136
Pipe 231
Nickel-plated 146
Plastic-lined 117
PVC 118
Rubber-lined 107
Welded 28
Pipe Compound 202
Pipe Dope, Teflon 111
Pipe Engineering 232
Pipe & Fittings, Corrosion-resistant 104, 182
Hard-rubber 172
Jacketed 241
Plastic Coating Processes 76
Plasticizers 61, 219
Low-temp 41
Plastics 115
Plate Fabrication 113
Plotters, X-Y 5
Polyethylenes 52, 214
Reinforced 44
Polyvinyl Chloride, Unplasticized 116
Porcelain Equipment, Chemical 114
Powders 60
Power Supplies 94
Precipitators, Electric 149
Presses, De-watering 242
Wax Molding 160
Pressure Meters 83
Pressure Vessels 215
Printers, Strip Chart 97
Process Engineering 161
Process Engineering Economics 139
Process Tanks 165
Processing Equipment 74, 166
Processing Equipment Service 169
Processing Vessels, Lined 198
Proportioning Systems 127
Protective Coatings, Hot Spray 69
Pulverizers 157, 158
Pumps 113, 192
Acid-handling 180
All-purpose Diaphragm 214
Canned Centrifugal 206
Centrifugal .. 31, 180, 198, 232
Centrifugal Self-priming 223
Chemical 117, 201, 219
Controlled-volume 87
Corrosion-resistant 182, 190, 203, 238
Corrosion-resistant Plastic 177
Direct Flow 228
Double-ended 188
Duplex-diaphragm 181
Leak-proof 227
Liquid Gas, Slurry 194
Micro-bellows 153
Midget 111
Plunger 181
Positive-displacement 181, 187
Rotary 154
Self-priming Stainless 109
Slurry 180
Splitshell 224
Sump 224
Turbine-type 230
Vacuum 210, 221
Pyrometers, Indicating 142

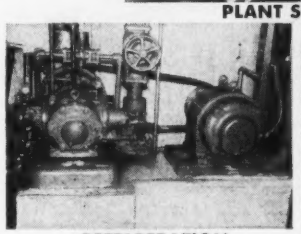
Q

Quaternary Ammonium Compounds 22

R

Rare Earth Compounds 60
Rare Earth Oxides 37
Reactors 212
Glassed-steel 111
Glass-lined 67, 165
Plastic 160
Polymerization 172
Readout, Graphical 5
Reagent Bottles, Throw-away 156

PLANT SERVICES



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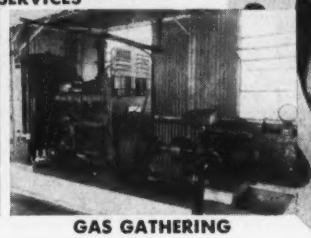
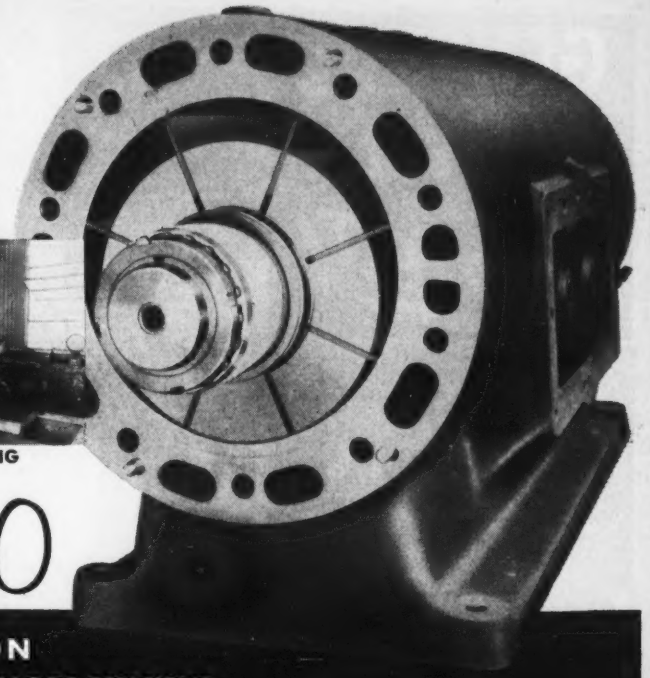


GAS GATHERING



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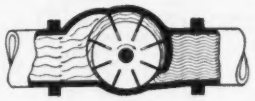

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- Provide a high degree of reliability, thereby reducing standby capacity requirements
- Have few moving parts, thus sharply reducing parts inventory
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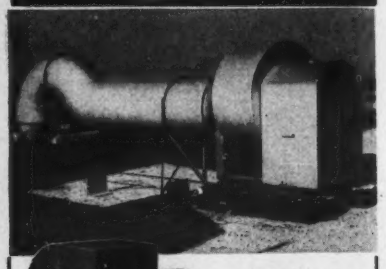

GB blower went into service at Eversharp Inc., Chicago, Ill. in 1954. Four other GB blowers are also in use handling fumes, wastes, and particles.

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When inquiring check CP 5708 opposite last page

Reagents, Colorimetric 37
Chromatographic 37
Recorders 102-103
Electronic & Pneumatic .. 96-97
Graphic 88
Humidity 100
Temperature 101
Time 14
Reducers 136
Reference Data 137
Refractory Materials 221
Refractory Products 76-77
Refrigeration System 16
Refrigerators, Laboratory 224
Refuse Hoppers 130-131
Regulators, Air 92
Jet-pipe 92
Relays, Mercury 87
Sensitive 210
Resins 42, 49
Epoxy 48, 53
Modified Triazine 52
Polyester 27, 52
Vinyl 115
Rollers, Conveyor 133
Roof Coolers 211
Rotameters 94
Rubber Linings & Coverings 107
Rubber Reclaiming 26
Rubbers, Nitrile 51
Synthetic 79
Rupture Discs 182
Rust Control 182

S

Safety Heads 146
Safety Helps 221
Salt Dissolvers, Plastic 108
Scales 130, 135
Bagging 176
Industrial 122
Scanning Systems 101
Scraper Storage Machines 134
Scrapers, Earth-moving 215
Screening 236
Screens 220
Vibrating 168
Seal Cages, Teflon 186
Seals, Mechanical 67, 118
Selectors 157
Separators 157
Centrifugal Air 166
Cylinder 162
Disc 162
Hermetic 171
Magnetic 187
Screen 220
Vibrating Screen 164
Sequestering Agents 159
Shields, Eye 147
Shims 224
Shovel Loaders 126
Shovels, Tractor 123, 124-125
Showers, Column 203
Sifters 166
Silica, Fine 49
Silicate Clay 54
Silicone Rubbers, Reinforced 54
Silos, Glass-lined 122
Slide Rules 193
Sodium, Metallic 38
Sodium Lauryl Sulfate 22
Sodium Phosphates 48
Sodium Sulfhydrate 44
Sodium Sulfide 44
Solvent Recovery Systems .. 49
Spectrophotometers 215
Infrared 158
Speed Reducers 184
Spray Guns, Spark-resistant .. 186
Sprinklers, Automatic 141
Sprockets 121
Stair Treads, Steel 134
Staplers 176
Steam Traps 25, 184, 209
Bucket 30-31
Steel, Clad 108
Stencil Inks 177
Strain Gages 95
Strainers, Pipe 209
Strapping Table 179
Storage Units, Glass-lined .. 122
Styrene Molding Compounds 43
Sulfuric Anhydride, Stabilized 2
Surface-active Agents 37
Switches, Key & Push-button 138
Mercury 229
Rotary 138

T

Tables, Temperature-conversion 101
Tagged Organics 45
Tank Linings, Corrosion-proof 116
Tank Trailers, Glassed-steel 116
Tanks 236
Corrosion-resistant 74
Stainless Steel 222
Tantalum 112, 116
Tantalum for Sulfuric Acid .. 231
Tape, Labeling 179
Technical Information Services 75
Teflon 242
Telemetering Instruments 96-97
Telephones, Intra-plant 122
Templates, Drafting 96
Terminals, Porcelain 84
Testers, Ultrasonic 149
Tetrahydrofurfuryl Alcohol .. 58
Textile Latices 61
Thermocouple Switches 142
Thermocouples 100, 214
Thermometers 139
Dial 88
Industrial 86
Surface 98, 152
Thickeners, Continuous 160
Thickening Agents 46
Thioglycolic Acid 22
Thorium 60, 73
Titanium 229
Tower Packings, Porcelain .. 202
Towers 182
Tractor Shovels 123, 124-125, 126
Transmitters, Conductivity .. 94
Truck & Drain Rack 120
Trucks, Diesel Fork 133
Hand 120
Industrial 124
Lift 128
Pallet 135
Tube, Cooling & Heating 199
Filter 187
Finned Condenser .. Bet. 66-67
Instrument 100
Seamless 9
Welded 28
Tube Cleaners 218
Tube Expanders 218
Tube Maintenance Equipment 202

U

Unit Operations 138
Urea, Crystal 55
Utensils, Stainless & Monel .. 153

V

Valves 190, 211, 216, 225, 241
Angle 200
Bellows 18-19
Bronze 199
Butterfly 142, 219, 223
Check 200
Chemical 119
Control 84-85, 99, 100
Corrosion-resistant 182
Corrosion-resistant Diaphragm 189
Diaphragm 18-19, 228
Drain 208
Drain & Sampling 94
Gate 200
Globe 73, 200
Hard-rubber 172
Lubricated Plug 204
Pilot-operated 196
Pinch 18-19
Plastic-lined 117
Plug 73
Relief 18-19
Regulating 194
Rubber-lined or Plastic 107
Segregating 123
Solder-end 27
Vapor Condenser 196
Ventilators 134
Venturi Tube 241
Vermiculite 28
Vibration Control 230
Vibrators 214
Air & Electric 132
Mechanical 129
Vinyl Esters 57
Viscometers 150

W

Washers 224
Washing Equipment 166
Waste Disposal 225
Waste Recovery, Steel Mill .. 72
Water Conditioners 71
Water Repellents 43
Water Supply 78
Water Treatment Systems 32, 163
Welding Copper 219
Welding Electrodes 185
Welding Fittings 24
Wetting Agents 37
Wire, Magnesia-insulated 226
Wire Cloth 236
Wire Mesh 228
Wipers, Paper 159
White Oils 41

X

Xerography 93
X-ray Diffraction Units 150

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ADVERTISERS in this issue

A

Abbé Engineering Company 153
Agency-Spooner & Kriegel

ADSCO Industries, Inc., Alberger Heater Division 196
Agency-Warman, Robins & Gorham, Inc.

ADSCO Industries, Inc., American District Steam Division 232
Agency-Warman, Robins & Gorham, Inc.

Airetool Manufacturing Company 202
Agency-Harry M. Miller, Inc.

Aldrich Pump Company, The 228
Agency-Harris D. McKinney, Incorporated

Alemite Division of Stewart-Warner 195
Agency-MacFarland, Aveyard & Company

Allen-Bradley Co. 143
Agency-The Fensholt Advertising Agency, Inc.

Allin Manufacturing Company 154
Agency-Roy D. Zeff & Associates, Inc.

Allis-Chalmers, Buda Division 133
Agency-Bert S. Gittins Advertising, Inc.

Allis-Chalmers, Construction Machinery Division 123
Agency-Bert S. Gittins Advertising, Inc.

Allis-Chalmers, General Products Division ..... opp. 26
Agency-Compton Advertising, Inc.

Allpax Company, The 144
Agency-J. Wheelock Associates

Alsop Engineering Corporation 236

Aluminum Company of America 233
Agency-Ketchum, MacLeod & Grove, Inc.

Amercoat Corporation 4th Cover
Agency-Anderson-McConnell Advertising Agency, Inc.

American Agile Corporation 113
Agency-Dix & Eaton

American Air Filter Company, Inc. 70
Agency-Doe-Anderson Advertising

American Chain & Cable, R-P&C Valve Division 200
Agency-Reincke, Meyer & Finn, Inc.

American Chemical Paint Company 109
Agency-Gray & Rogers

American Hard Rubber Company 107
Agency-W. L. Towne Advertising

American Machine & Metals, Inc., Niagara Filters Division 164
Agency-Marsteller, Rickard, Gebhardt and Reed, Inc.

American Machine & Metals, Inc., Tolhurst Centrifugals Division 165
Agency-Marsteller, Rickard, Gebhardt and Reed, Inc.

American Potash & Chemical Corporation 58
Agency-The McCarty Company

American Pulley Company, The, Power-Transmission Division 184
Agency-Robert S. Kampmann Jr.

Ampco Metal, Inc. 104
Agency-Hoffman & York, Inc.

Annin Company, The 99
Agency-The McCarty Company

Antara Chemicals, A Sales Division of General Aniline & Film Corporation .. 37
Agency-The House of J. Hayden Twiss

Armour and Company, Armour Chemical Division .. 40
Agency-Foote, Cone & Belding

Armstrong Machine Works 30, 31
Agency-Russell T. Gray, Inc.

Arrow Tools, Inc. 92
Agency-Vernon S. Weiler Advertising

Askania Regulator Company 92
Agency-Reincke, Meyer & Finn, Inc.

Assembly Products, Inc. 210
Agency-George E. Duff Advertising

Atlas Mineral Products Company 116
Agency-Harry Rollinson Jr.

Atlas Powder Co. 52
Agency-The Aitkin-Kynett Co.

Aurora Pump Division, The New York Air Brake Company 230
Agency-Fred A. Hinrichsen Advertising

"Automatic" Sprinkler Corporation of America 141
Agency-The Robert A. Joyce Company

B

Babcock & Wilcox Co., The, Refractories Division 66
Agency-Michel-Cather, Inc.

Babcock & Wilcox Company, The, Tubular Products Division 9
Agency-O. S. Tyson and Company, Inc.

Baker & Company, Inc. 144
Agency-Art-Copy Advertising

Baker Rauling Company, The, A Subsidiary of Otis Elevator Company 126
Agency-G. M. Basford Company

Baldwin-Hill Company 239
Agency-Eldridge, Inc.

Ballymore Company 146
Agency-The Eldridge Company

Barco Manufacturing Co. 226
Agency-Armstrong Advertising

Barnebey-Cheney Company .. 49
Agency-Byer & Bowman Advertising

Bartlett & Snow Co., The C. O. 161
Agency-Henry T. Bourne Advertising Agency, Inc.

Bart Manufacturing Corp. 146
Agency-Bass and Company, Inc.

Belt Corporation, The 126
Agency-Byer & Bowman Advertising

Bemis Bro. Bag Co. 178
Agency-Gardner Advertising Co.

B-I-F Industries, Omega Machine Company Division 90, 91
Agency-Horton, Church & Goff Inc.

Bird Machine Company 7
Agency-Walter B. Snow & Staff, Inc.

Black, Sivalls & Bryson, Inc., Safety Head Division 140
Agency-Potts, Woodbury, Inc.

Blockson Chemical Company, Division of Olin Mathieson Chemical Corporation 48
Agency-William Balsam Advertising

Bradley Washfountain Co. .. 203
Agency-Kirkgasser-Drew

Bristol Company, The 96, 97
Agency-James Thomas Chirurg Company

Brookfield Engineering Laboratories, Inc. 150
Agency-Creamer-Trowbridge Company

Brooks Rotameter Company 94
Agency-Thomas R. Sundheim Advertising

Buell Engineering Company 149
Agency-Hicks & Greist Incorporated

Buffalo Pumps, Division of Buffalo Forge Company 224
Agency-Melvin F. Hall Advertising Agency, Inc.

Buflovak Equipment Division, Blaw-Knox Company 169
Agency-Ketchum, MacLeod & Grove, Inc.

C

Cambridge Instrument Co. .. 98
Agency-E. M. Freystadt Associates, Inc.

Cambridge Wire Cloth Co., The 226
Agency-Emery Advertising Corporation

Carborundum Co., The, Refractories Division 221
Agency-G. M. Basford Company

Ceilcote Company, Inc., The 105
Agency-Penn and Hamaker, Incorporated

Celanese Corporation of America, Chemical Division 145
Agency-Ellington & Company, Inc.

Chase Bag Company 174
Agency-William Hart Adler, Inc.

Chemical and Power Products, Inc. 186
Agency-Spooner & Kriegel

Chempump Corporation 227
Agency-The Aitkin-Kynett Co.

Cherry-Burrell Corporation .. 222
Agency-The Buchen Company

Chicago Blower Corp. 118
Agency-Robertson, Buckley & Gotsch, Inc.

Chicago Steel Tank Company, Division of U.S. Industries, Inc. 23
Agency-Grimm & Craigle

Chicago-Wilcox Mfg. Co. 224
Agency-Fred H. Ebersold, Inc.

Chicopee Manufacturing Corporation 26
Agency-Brooks-Pollard Company

Chiksan Company, A Subsidiary of Food Machinery and Chemical Corporation 27
Agency-The McCarty Company

Cleveland Vibrator Company, The 132
The Wellman-Buschman Co.

Cobra Metal Hose Division, DK Mfg. Co. 118
Agency-Hanson and Hanson, Inc.

Commercial Filters Corporation 187
Agency-LaGrange & Garrison Incorporated

Commercial Solvents Corp., Industrial Chemicals Dept. 214
Agency-Fuller & Smith & Ross Inc.

Conoflow Corporation, Subsidiary of Walworth Company 100
Agency-The Roland G. E. Ullman Organization

Continental Can Company .. 129
Agency-Batten, Barton, Durstine & Osborn Incorporated

Cooper Alloy Corporation, Valve and Fitting Division 229
Agency-Mahool Advertising, Inc.

Coppus Engineering Corporation 134
Agency-James Thomas Chirurg Company

Corning Glass Works .. 116, 159
Agency-Charles L. Rumrill & Co., Inc.

Crane Co. 225
Agency-The Buchen Company

Crane Packing Company 211
Agency-Symonds, MacKenzie & Company, Inc.

Cuno Engineering Corporation 173
Agency-James Thomas Chirurg Company

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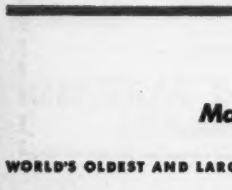

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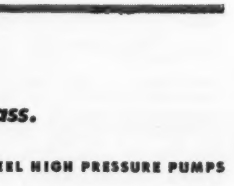

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When inquiring check CP 5711A opposite last page

Cyclotherm Division, National U. S. Radiator Corp. 168
Agency-Chapman-Nowak & Associates, Inc.

D

Darling Valve & Manufacturing Co. 203
Agency-The Griswold-Eshleman Co.

Davenport Machine and Foundry Company 242
Agency-Bawden Bros., Inc.

Davis Emergency Equipment Co., Inc., Davis Instruments Division 148
Agency-United Advertising

Davison Chemical Company, Division of W. R. Grace & Co. 60
Agency-St. Georges & Keyes, Inc.

Decker Aviation Corporation 83
Agency-The Harry P. Bridge Company

De Laval Separator Company, The 171
Agency-Donahue & Coe, Inc.

Dempster Brothers 130, 131
Agency-Charles S. Kane Co.

Diamond Chain Company, Inc. 74
Agency-Kirkgasser-Drew

Doré Co., John L. 8
Agency-Ullrich and Brown

Dorr-Oliver, Incorporated 180, 181
Agency-Sutherland-Abbott

Dow Chemical Company, The 117
Agency-MacManus, John & Adams, Inc.

Dow Corning Corporation .. 54
Agency-Church and Guisewite Advertising, Inc.

Downingtown Iron Works, Inc. 113
Agency-The Buchen Company

Dravo Corporation 134
Agency-Ketchum, MacLeod & Grove, Inc.

Du Pont de Nemours & Co. (Inc.), E. I., Polychemicals Dept. 55
Agency-Batten, Barton, Durstine & Osborn Incorporated

Durametallic Corporation 118
Agency-Ogden Advertising

Dustex Corporation 188
Agency-Comstock & Company

E

Eaton-Dikeman Co., The 192
Agency-Arthur Olian, Inc.

Eclipse Air Brush Co. 232
Agency-Gordon A. Pihl and Associates

Eco Engineering Company .. 203
Agency-Mahool Advertising, Inc.

Eimco Corporation, The 75
Agency-Matsie Company

El Dorado Division, Foremost Food and Chemical Co. 52
Agency-Sidney Garfield & Associates, Inc.

Elgin Softener Corporation .. 163
Agency-Kreicker & Meloan, Inc.

Emery Industries, Inc. 54
Agency-Ruthrauff & Ryan, Inc.

Eriez Manufacturing Company 79
Agency-Gotham-Vladimir Advertising, Inc.

Ertel Engineering Corporation 152
Agency-W. N. Hudson, Advertising

F

Falcon Alarm Company, Inc. 144
Agency-Ray Ellis Advertising

Falls Industries Inc. 182
Agency-Scheel Advertising Agency, Incorporated

Fansteel Metallurgical Corporation, Chemical Equipment Division 112
Agency-Symonds, MacKenzie & Company, Inc.

Farris Affiliated Companies 18, 19
Agency-Lewis Advertising

Firestone Plastics Company, Chemical Sales Division .. 115
Agency-Grey Advertising Agency, Inc.

Fischbein Co., Dave 176
Agency-Fischbein Advertising

Fisher Scientific Co. 156
Agency-Smith, Taylor & Jenkins, Inc.

Flexitallic Gasket Company 20
Agency-William Jenkins Advertising Incorporated

Flexrock Company 242
Agency-Walter S. Chittick Company

Foxboro Company, The 102, 103
Agency-Horton-Noyes Company

Fritzsche Brothers, Inc. 46

Fuller Company, A Subsidiary of General American Transportation Corp. 235
Agency-O. S. Tyson and Company, Inc.

G

Gabb Special Products, Division of E. Horton & Son Co. 152
Agency-Charles Palm & Co.

Gallaher Company, The 148
Agency-Holland Advertising

Gaylord Container Corporation, Division of Crown Zellerbach Corporation 132
Agency-Oakleigh R. French & Associates Inc.

General American Transportation Corporation, Louisville Drying Machinery Unit 21
Agency-Weiss and Geller, Inc.

General Blower Company 236
Agency- Connor Associates, Inc.

General Chemical Division, Allied Chemical & Dye Corporation ..... 2nd Cover
Agency-Atherton & Currier, Inc.

Gerotor May Corporation 204
Agency-Welch, Collins & Mirabile, Inc.

Glas-Col Apparatus Company 151
Agency-The Fensholt Advertising Agency, Inc.

Glascote Products, Inc., A Subsidiary of A. O. Smith Corporation 67
Agency-Klau-Van Pietersom-Dunlap, Inc.

Globe Company, The, Grip-Strut Division. 122
Agency-Ross Llewellyn Inc.

Glyco Products Co., Inc. 159
Agency-G. M. Basford Company

Goslin-Birmingham Manufacturing Co., Inc. 172
Agency-J. Howard Allison & Company

Goulds Pumps Inc. 201
Agency-Charles L Rumrill & Co., Inc.

Graphic Systems 164
Agency-Diener & Dorskind Incorporated

Gustin-Bacon Manufacturing Co. 78
Agency-Valentine-Radford

H

Hanna Engineering Works 65
Agency-Schnell & Associates

Hapman Conveyors, Inc., Division Hapman-Dutton Company 122
Agency-Paxson Advertising Incorporated

Harrisburg Steel Corporation 188
Agency-Thoma & Gill

Harshaw Chemical Co., The 50

Hart-Carter Co. 162
Agency-Olmsted & Foley Advertising

Hercules Powder Company .. 36
Agency-Fuller & Smith & Ross, Inc.

Hetherington & Berner Inc. 241
Agency-Caldwell, Larkin & Sidener-Van Riper, Inc.

Heyden Chemical Corporation 53
Agency-Sommers-Davis Inc.

Heyl & Patterson Inc. 231
Agency-Dan A. Sullivan

Hills-McCanna Co. 189
Agency-Russell T. Gray, Inc.

Hoke Incorporated 216
Agency-Lewis Advertising

Hooker Electrochemical Company 44
Agency-Charles L. Rumrill & Co., Inc.

Hough Co., The Frank G., Subsidiary International Harvester Company .. 124, 125
Agency-Ervin R. Abramson Advertising

I

Illinois Testing Laboratories, Inc. 152
Agency-The Buchen Company

Illinois Water Treatment Co. 158
Agency-Cummings, Brand & McPherson

Industrial Filter & Pump Mfg. Co. 168
Agency-Hollander & Weghorn

Industrial Plastic Fabricators, Inc. 202, 208
Agency-Tippett & Company, Inc.

Inland Steel Container Company, Division of Inland Steel Company 175
Agency-Weiss and Geller, Inc.

International Nickel Company, Inc., The 185, 224
3rd Cover
Agency-Marschalk and Pratt, Division of McCann-Erickson, Inc.

Irving Subway Grating Co., Inc. 198
Agency-Richmond Advertising Service Inc.

J

Jelliff Mfg. Corp., The C. O. 228
Agency-William Hill Field

Jerguson Gage & Valve Company 94
Agency-Roy Elliott Company

Johns-Manville 80, 81
Agency-J. Walter Thompson Company

Johnson Corporation, The 194
Agency-Kreicker & Meloan, Inc.

Justrite Manufacturing Co. .. 240

K

Kaykor Industries, Inc., Division of Kaye-Tex Manufacturing Corp. 116
Agency-The Harry P. Bridge Company

Kellogg Company, The M. W., Subsidiary of Pullman Incorporated 106
Agency-Ellington & Company Inc.

Keystone Valve Corp. 190
Agency-W. L. Culver Advertising Service

Kinney Mfg. Division, The New York Air Brake Company 154
Agency-Horton, Church & Goff Inc.

Knox Porcelain Corporation 202

Kollmorgen Optical Corporation 154
Agency-Sanger-Funnell, Incorporated

Kuhns Brothers Co., The 186
Agency-The Parker Advertising Company

L

LaBour Company, Inc., The 223
Agency-Grimm & Craigle

Lapp Insulator Company, Process Equipment Division 114
Agency-Ed Wolff & Associates

Lee Metal Products Co., Inc. 74
Agency-Downing Industrial Advertising, Inc.

Librascope Incorporated 5
Agency-Western Advertising Agency, Inc.

Link-Belt Company 121, 135
Agency-Klau-Van Pietersom-Dunlap, Inc.

Liquidometer Corp., The 98
Agency-Gaynor Coleman Prentis & Varley, Inc.

Los Alamos Scientific Laboratory of the University of California 156
Agency-Ward Hicks Advertising

Louisville Drying Machinery Unit, General American Transportation Corporation 21
Agency-Weiss & Geller, Inc.

Lukens Steel Company 108
Agency-J. M. Mathes, Incorporated

Lumenite Electronic Company 100
Agency-Bachrodt, Newell, O'Kane and Gano, Inc.

Luzerne Rubber Company, The 172
Agency-Eldridge, Inc.

Mc

McDanel Refractory Porcelain Company 148
Agency-Meek and Thomas, Inc.

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When inquiring check CP 5714 opposite last page

M

Magnetrol, Inc. 237
Agency-Stoetzel & Associates, Inc.

Manning, Maxwell & Moore, Inc. 88, 213
Agency-Fuller & Smith & Ross Inc.

Manton-Gaulin Manufacturing Company, Inc. 238
Agency-Sutherland-Abbott

Marsh Instrument Co., Sales Affiliate of Jas. P. Marsh Corp. 94
Agency-Kreicker & Meloan, Inc.

Martin Engineering Company 214
Agency-Kenneth B. Butler & Associates

Mason-Neilan, Division of Worthington Corporation 84, 85
Agency-Sutherland-Abbott

Master Builders Co., The, Division of American-Marietta Co. 200
Agency-The Bayless-Kerr Company

Mathieson Chemicals 56
Agency-Doyle, Kitchen & McCormick, Inc.

Meriam Instrument Co., The 138
Agency-Thomas R. Sundheim Advertising

Metals Disintegrating Company, Inc. 205
Agency-Reid, Decker and Stocki, Inc.

Metalsmiths, Division of Orange Roller Bearing Co., Inc. 153
Agency-Thoma & Gill

Metco Systems 119
Agency-The Schuyler Hopper Co.

Midwest Piping and Supply Company 24
Agency-Witte & Burden

Milton Roy Company 87
Agency-The Aitkin-Kynett Co.

Moore & Company, Samuel, Dekoron Products Division 100
Agency-Palm & Patterson Incorporated

Morehouse-Cowles, Inc. 183
Agency-Willard G. Gregory & Co.

Morningstar, Nicol, Inc. 46
Agency-The Vanden Company Inc.

Morse Manufacturing Co., Inc. 164
Agency-Chapman-Nowak & Associates, Inc.

Mortell Co., J. W. 112
Agency-Ross Roy, Inc.

Multi-Metal Wire Cloth Co., Inc. 236
Agency-Spooner & Kriegel

Munson Mill Machinery Co. 167
Agency-Moser & Cotins Inc.

N

National Aniline Division, Allied Chemical & Dye Corporation 39, 45
Agency-James J. McMahon, Incorporated

National Business Publications, Inc. 59
Agency-G. M. Basford Company

National Distillers Products Corporation, U. S. Industrial Chemicals Co., Division 38
Agency-G. M. Basford Company

National Engineering Co., Simpson Mix-Muller Division 217
Agency-Russell T. Gray, Inc.

National Filter Media Corp., The 170
Agency-Sanger-Funnell, Incorporated

National Starch Products Inc., Resin Division 42
Agency-G. M. Basford Company

Neptune Meter Company 210
Agency-W. L. Towne Advertising

Newport News Shipbuilding and Dry Dock Company .. 215
Agency-Marschalk and Pratt, Division of McCann-Erickson, Inc.

Niagara Filters, A Division of American Machine and Metals, Inc. 164
Agency-The L. W. Ramsey Advertising

Nitrogen Division, Allied Chemical & Dye Corporation 57
Agency-G. M. Basford Company

Norton Company, Refractories Division 76, 77
Agency-James Thomas Chirurg Company

Norwalk Company, Inc. 68
Agency-Robert H. Ramage

O

Olin Mathieson Chemical Corporation, Industrial Chemicals Division 56
Agency-Doyle, Kitchen & McCormick, Inc.

Okadee Company 241
Agency-Armstrong Advertising

Oronite Chemical Company 35
Agency-L. C. Cole Company, Inc.

P

Pacific Transducer Corp. 98
Agency-The Martin R. Klitten Company, Inc.

Palmer-Shile Co. 120
Agency-Alfred B. Caldwell, Inc.

Palmer Thermometers, Inc. .. 139
Agency-The Bohnett Company

Patterson-Kelley Co., Inc., The 197
Agency-O. S. Tyson and Company, Inc.

Penberthy Injector Company, Division of the Buffalo-Eclipse Corporation 93
Agency-Comstock & Company

Pennsylvania Industrial Chemical Corp. 49
Agency-Downing Industrial Advertising, Inc.

Perkin-Elmer Corporation, The 147
Agency-G. M. Basford Company

Permutit Company, The 71
Agency-Cunningham & Walsh Inc.

Pfaudler Co., The 111
Agency-Charles L. Rumrill & Co., Inc.

Pioneer Rubber Company, The 142
Agency-Carr Liggett Advertising, Inc.

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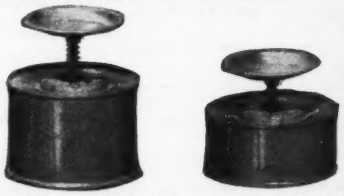

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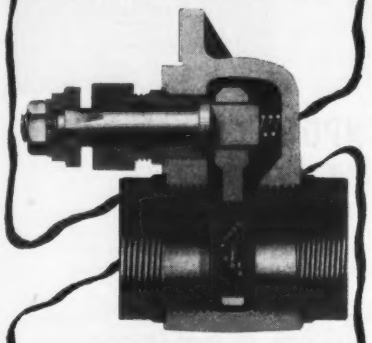

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When inquiring check CP 5716 opposite last page

Pittsburgh Coke & Chemical Co., Activated Carbon Division 61
Agency-W. S. Walker Advertising, Inc.

Pittsburgh Coke & Chemical Co., Industrial Chemicals Division 43
Agency-W. S. Walker Advertising, Inc.

Pittsburgh Corning Corporation 193
Agency-Ketchum, MacLeod & Grove, Inc.

Powers Regulator Company, The 95
Agency-Symonds, MacKenzie & Company, Inc.

Pressed Steel Tank Company 177
Agency-The Buchen Company

Proctor & Schwartz Inc. 155
Agency-Robert S. Kampmann, Jr.

Propellair Division of Robbins & Myers, Inc. 192
Agency-Greenbaw & Rush, Inc.

Protective Lining Corporation 240
Agency-Allan Rock Advertising

Puget Sound Fabricators, Inc. 165
Agency-David Pollock

Pulverizing Machinery Division, Metals Disintegrating Company, Inc. 205
Agency-Reid, Decker and Stocki, Inc.

Putman Publishing Company 107, 206, 207, 230, 232

Q

Quaker Oats Company, The, Chemicals Dept. 58
Agency-Rogers & Smith Advertising

Quaker Rubber Division, H. K. Porter Company, Inc. 110
Agency-Fox & Mackenzie Advertising

R

Raymond Laboratories, Inc. 22
Agency-Keystone Advertising, Inc.

Read Standard Corporation, Blower-Stoker Division 194
Agency-Adams Associates, Inc.

Reliance Electric and Engineering Company 32, 33
Agency-The Wellman-Buschman Co.

Republic Manufacturing Co. 211
Agency-J. N. Paterson & Associates

Research Appliance Company 153
Agency-Marsteller, Rickard, Gebhardt and Reed, Inc.

Revere Copper and Brass Incorporated 219
Agency-St. Georges & Keyes, Inc.

Reynolds Ink, Inc. 177
Agency-Henry T. Bourne Advertising Agency, Inc.

Rheem 179
Agency-Campbell-Ewald Company

Richardson Scale Company, The 127
Agency-O. S. Tyson and Company, Inc.

Rietz Manufacturing Co. 166
Agency-Levinger Advertising

Robinson Air-Activated Conveyor Systems, A Division of Morse Boulger Destructor Co. 128
Agency-Sanger-Funnell, Incorporated

Rockwell Manufacturing Co. 89
Agency-Marsteller, Rickard, Gebhardt and Reed, Inc.

Rockwell Company, W. S. 142, 158
Agency-Spooner & Kriegel

Ruppright's Rotary Roof Cooler 211

Rusticide Products Co. 182
Agency-The Bayless-Kerr Company

S

Safety Car Heating and Lighting Company, Inc., The, Entoleter Division 167
Agency-J. C. Bull Inc.

Safety Car Heating and Lighting Company, Inc., The, Lighting Division 176
Agency-J. C. Bull Inc.

Saran Lined Pipe Company .. 117
Agency-MacManus, John & Adams, Inc.

Sarco Co., Inc. 209
Agency-Marsteller, Rickard, Gebhardt and Reed, Inc.

Sauerman Bros., Inc. 134
Agency-Symonds, MacKenzie & Company, Inc.

Schutz-O'Neill Company 158
Agency-Foulke Agency, Inc.

Seiberling Latex Products, Division of Standard Industries, Inc. 128
Agency-McDaniel-Fisher & Spelman Co.

Sharples Corporation, The .. 72
Agency-Renner Advertisers

Shriver & Company, Inc., T. 150
Agency-Spooner & Kriegel

Siemens & Halske Aktiengesellschaft 82
Agency-Heilig u. Simon

Sigmamotor Inc. 194
Agency-Melvin F. Hall Advertising Agency, Inc.

Simplex Valve & Meter Company 241
Agency-Cunningham & Walsh Inc.

Simpson Mix-Muller Division of National Engineering Co. 217
Agency-Russell T. Gray, Inc.

Sindar Corporation 214
Agency-Hazard Advertising Company, Inc.

Sirrine Co., J. E. 166
Agency-The Roland G. E. Ullman Organization

Smith Corporation, A. O., Harvestore Division 122
Agency-Klau-Van Pietersom-Dunlap, Inc.

Solvay Process Division, Allied Chemical & Dye Corporation 47
Agency-Atherton & Currier, Inc.

Sonneborn Sons, Inc., L., White Oil & Petrolatum Division 41
Agency-St. Georges & Keyes, Inc.

Southwestern Engineering Company 220
Agency-Charles Bowes Advertising

Sperry Co., D. R. 167
Agency-Illinois Simmonds & Simmonds Incorporated

Steelcote Manufacturing Co. 196
Agency-Wesley K. Nash Company

Stewart Industries, Inc. 210
Agency-Gallard Advertising Agency, Inc.

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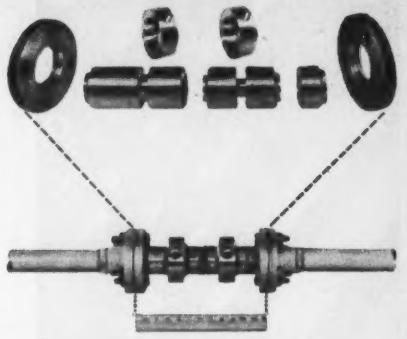

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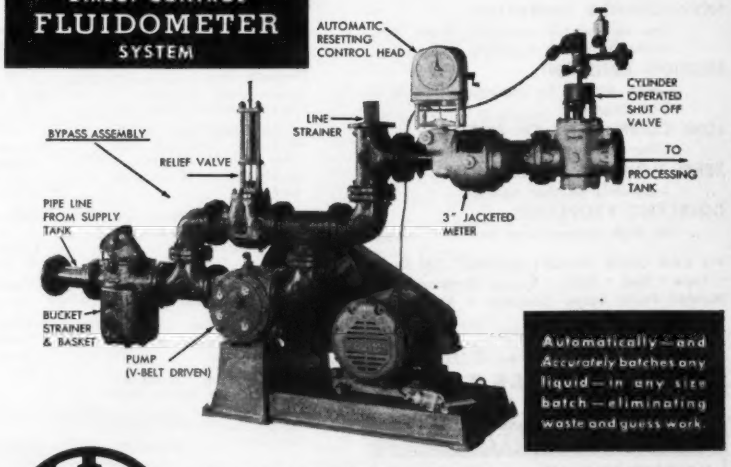
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When inquiring check CP 5718 opposite last page

Stewart Warner, Alemite Division 195
Agency-MacFarland, Aveyard & Company

Stockdale Engineering Co. .. 228
Agency-Renner Advertisers

Strahman Valves, Inc. 208
Agency-Picard, Marvin & Redfield

Struthers Wells Corp. 198
Agency-Downing Industrial Advertising, Inc.

Sturtevant Mill Company 157
Agency-F. P. Walther, Jr. & Associates, Inc.

Sun Oil Company 51
Agency-Ruthrauff & Ryan Inc.

Sylvania Electric Products Incorporated 74
Agency-J. Walter Thompson Company

T

Taber Pump Co. 190
Agency-Tyler Kay Company, Inc.

Tamms Industries, Inc. 49
Agency-MacCowan Advertising

Taylor Instrument Companies 101
Agency-Batten, Barton, Durstine & Osborn, Incorporated

Tennessee Corporation 212
Agency-Crawford & Porter Inc.

Thayer Scale and Engineering Corporation 176
Agency-W. Robert Robotham Advertising, Inc.

Thermal Research & Engineering Corp. 230
Agency-Braun & Miller

Thermco Laboratories 226
Agency-Applegate and Associates, Inc.

Thermo Electric Co., Inc. 138
Agency-Fred Lange Associates, Inc.

Thomas Flexible Coupling Company 188
Agency-Lando Advertising

Titeflex, Inc., Industrial Products Div. 62, 63
Agency-Arndt, Preston, Chapin, Lamb & Keen, Inc.

Tolhurst Centrifugals A Division of American Machine and Metals Inc. 165
Agency-The L. W. Ramsey Advertising

Treen Box Company 126
Agency-Nat M. Kolker Advertising

Trent, Inc. 165
Agency-The Roland G. E. Ullman Organization

Tri-Lok Company 134
Agency-Ketchum, MacLeod & Grove, Inc.

Tropical Paint Company, Subsidiary of Parker Rust Proof Company 200
Agency-The Fred M. Randall Company

U

Union Iron Works 240
Agency-Harold Warner Co.

U. S. Gasket — Belmont Packing 136
Agency-The Michener Company

U. S. Industrial Chemicals Co., Division of National Distillers Products Corporation 38
Agency-G. M. Basford Company

U. S. Stoneware, Plastics and Synthetics Division 69
Agency-Ralph Gross Advertising, Inc.

United States Gauge-Division of American Machine and Metals, Inc. 139
Agency-Hening & Company, Incorporated

Universal Road Machinery Co., Rubert M. Gay Division 165
Agency-Posner-Zabin Advertising

V

Vanton Pump & Equipment Corp., Division of Cooper Alloy Corporation 177
Agency-Mahool Advertising, Inc.

Viking Pump Company 192
Agency-J. M. Hickerson Inc.

Vogt Machine Co., Henry 64
Agency-Farson, Huff & Northlich

Vulcan Containers, Inc. 234
Agency-Clarence H. Russell Associates

W

W-K-M Manufacturing Company, Inc., A Subsidiary of ACF Industries, Incorporated 73
Agency-Ullrich and Brown

W-S Fittings Division, H. K. Porter Company, Inc. 137
Agency-W. L. Towne Advertising

Wagner Electric Corporation 29
Agency-Arthur R. Mogge Incorporated

Walworth Company, The 199
Agency-G. M. Basford Company

Welding Fittings Corp. 3
Agency-W. L. Hill Company

West Bend Equipment Corp. 128
Agency-Morrison-Greene-Seymour Inc.

Western Precipitation Corporation 191
Agency-Dozier Eastman and Company

West Instrument Corporation 142
Agency-Critchfield & Company

Weston Electrical Instruments Corporation 86
Agency-G. M. Basford Company

Wiegand Company, Edwin L. 170
Agency-Ketchum, MacLeod & Grove, Inc.

Wilson, Inc., Thomas C. 218
Agency-Michel-Cather, Inc.

Wolverine Tube Division of Calumet & Hecla, Inc. opp. 66
Agency-Gray & Kilgore, Inc.

Y

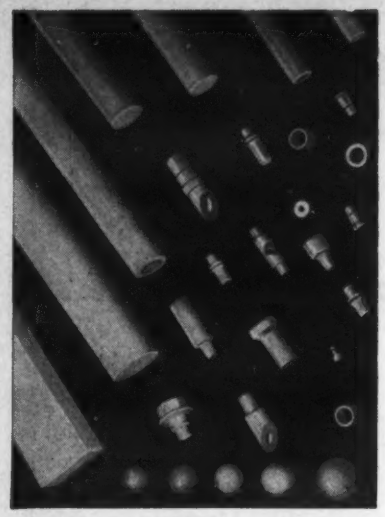
Yarnall-Waring Company 25
Agency-The Michener Company

York Process Equipment Corp. 166
Agency-Ray Ellis Advertising

Youngstown Welding & Engineering Co., The 28
Agency-Flad, Erwin and Klein Advertising

Z

Zonolite Company 28
Agency-Ruthrauff & Ryan Inc.



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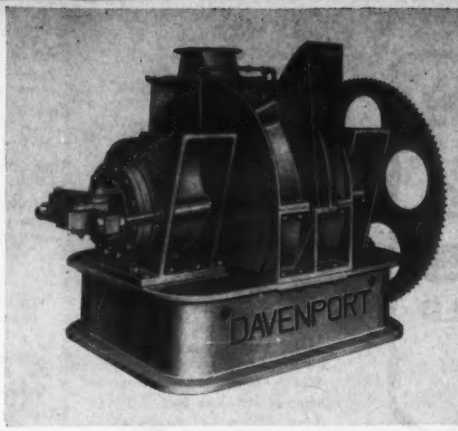

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√	Key	Description
☐	5119	Stabilized Sulfuric Anhydride
☐	5120	Corrosion-resistant Welding Fittings
☐	5121	Plotter
☐	5122	Filters
☐	5123a	Teflon Bellows
☐	5123b	Teflon-lined Expansion Joints
☐	5123c	Flexible Coupling
☐	5124	Seamless Tubes
☐	5125	Fluidized Limestone Dryer
☐	5126	Operation Recorder
☐	5127	Research Lab Facilities
☐	5128	Cooling Towers
☐	5129	Pulp Digesters
☐	5130a	Mechanical & Hydraulic Governors
☐	5130b	Relief Valves
☐	5130c	Diaphragm Valves
☐	5130d	Bellows Valves
☐	5130e	Pinch Valves
☐	5131	Spiral-wound Gasket
☐	5132	Dryer
☐	5133a	Sodium Lauryl Sulfate
☐	5133b	Quaternary Ammonium Compound
☐	5133c	Thioglycolic Acid
☐	5134	Freon
☐	5135	Refrigeration System
☐	5136	Heat Exchanger
☐	5137	Process Equipment Fabrication
☐	5138	"Long Tangent" Elbows
☐	5139	Fluid Coupling
☐	5140	Impulse Steam Trap
☐	5141	Non-woven Filter Fabric
☐	5142	Motors
☐	5143	Rubber Reclaiming
☐	5144	Motor Starters
☐	5145	Barge Loading Arm
☐	5146	Welded Pipe & Tubing
☐	5147	Vermiculite
☐	5148	Solder-end Valve
☐	5149a	Low-carbon-steel Test Kit
☐	5149b	Medium-carbon steel Test Kit
☐	5149c	High-carbon-steel Test Kit
☐	5150	Totally-enclosed Motors
☐	5151	TEL Meter
☐	5152	Bucket Steam Trap
☐	5153	Centrifugal Pump
☐	5154	Motors, Drives & Controls
☐	5155	Decolorizing Carbon
☐	5156	Alkane
☐	5157a	Nitrocellulose
☐	5157b	Defoamer
☐	5157c	Acetone
☐	5158	Nylon Dispersion
☐	5159a	Dithiooxamide
☐	5159b	Colorimetric Reagent
☐	5159c	Chromatographic Reagent
☐	5160	Rare Earth Oxides
☐	5161	Surface-active Agents
☐	5162	Handling Metallic Sodium
☐	5163	Aluminum Conditioning Process
☐	5164	Epoxy Hardeners
☐	5165	Diethanolamides
☐	5166	Aniline
☐	5167	Fatty Acids
☐	5168	Activated Carbon
☐	5169	Low-temp Vinyl Plasticizer
☐	5170a	White Oil
☐	5170b	Petrolatum
☐	5170c	Petroleum Sulfonate
☐	5171	Resins
☐	5172	Water Repellent for Concrete
☐	5173	Styrene Molding Compound
☐	5174	Molten Phthalic Anhydride
☐	5175a	Sodium Sulfide
☐	5175b	Sodium Sulfhydrate
☐	5175c	Caustic Soda
☐	5175d	Caustic Soda Buyer's Guide
☐	5176	Reinforced Polyethylene
☐	5177	Glass Fiber
☐	5178	Low-viscosity Resin
☐	5179	Tagged Organics
☐	5180a	Aromatic Diisocyanates (see coupon)
☐	5180b	Nacconates Product Data Package
☐	5181	Odor Control
☐	5182a	Emulsifiers
☐	5182b	Binders
☐	5182c	Flotation Agents
☐	5182d	Adhesives
☐	5183	Interior Gloss Enamels
☐	5184	Hydrogen Peroxide
☐	5185	Sodium Phosphates
☐	5186	Destaticizers for Polyethylene
☐	5187	Pesticide Emulsifier
☐	5188	AMP with 5% Water
☐	5189	"Solvent Recovery Actually Takes Dollars out of the Air"
☐	5190	Fine Silica
☐	5191	Resins
☐	5192	Industrial Chemicals
☐	5193	Phosphate Feed Solution
☐	5194	Hardener for Epoxides
☐	5195	Nitrile Rubber
☐	5196	Ether & Ethylene Glycol
☐	5197	Naphthenic Acid
☐	5198a	Organic Chemicals
☐	5198b	Antistatic Agents
☐	5198c	Polyester Resins
☐	5198d	Reprint of Magazine Article
☐	5199	Modified Triazine Resins
☐	5200	Polyethylene Specifications
☐	5201	Polyethylene Molding
☐	5202a	Coconut Oil
☐	5202b	Fatty Acid
☐	5202c	Methyl Esters
☐	5202d	Myristic Acid
☐	5203	Epoxy Resin
☐	5204	Lubricants
☐	5205	Hexamethylenetetramine
☐	5206	Polymerized Fatty Acid
☐	5207	Silicate Clay
☐	5208a	Antifoam A
☐	5208b	Anitfoam AF Emulsion
☐	5209	Reinforced Silicone Rubbers
☐	5210	Crystal Urea (state application)
☐	5211a	Ammonia
☐	5211b	Methanol
☐	5212	Fatty Acids in Grease Making
☐	5213	Iodine Source
☐	5214	Vinyl Esters
☐	5215	Formaldehyde
☐	5216	Tetrahydrofurfuryl Alcohol
☐	5217	Odor Masking Agents
☐	5218	Bisphenol A
☐	5220	Amorphous Elemental Boron
☐	5221	Industrial Products
☐	5222	Iron Phosphates
☐	5223a	Master Alloys
☐	5223b	Fluoro Chemicals
☐	5225	Thorium
☐	5226	Metal Powders
☐	5227	Dispersant for Cotton Bleaching
☐	5228	Lithium Hydroxide Monohydrate
☐	5229	Plasticizer for Food Packaging
☐	5230	CNC
☐	5231	Latices for Textiles
☐	5232	Granular Carbon
☐	5233	Quick-seal Couplings
☐	5234	Flexible Metal Hose
☐	5235	Scraped-surface Heat Exchangers
☐	5236a	Fluid Power Cylinder
☐	5236b	LP Cylinder
☐	5236c	HP Cylinder
☐	5237	Insulating Firebrick
☐	5238	Finned Condenser Tube
☐	5239a	Glass-lined Reactors
☐	5239b	Mechanical Seals
☐	5240	Compressors
☐	5241	Hot Spray Protective Coatings
☐	5242	Dust Control System
☐	5243	Industrial Gloves
☐	5244	Air Conditioning Systems
☐	5245	Water Conditioner
☐	5246	Crystal Dehydration
☐	5247	Valves & Fittings
☐	5248a	Corrosion-resistant Kettle
☐	5248b	Cooling & Vacuum Pan
☐	5248c	Processing Equipment
☐	5248d	Corrosion-resistant Tank
☐	5249	Roller Chains
☐	5250	High-purity Chemical (state use)
☐	5251	Vacuum & Pressure Filters
☐	5252	Castable Insulation
☐	5253	Plastic Coating Process
☐	5254	Glass-fiber Tank Insulation
☐	5255a	Magnetic Drum
☐	5255b	Magnetic Pulley
☐	5255c	"Magnetic Ideas"
☐	5256	Filter Aids
☐	5257	Sea Water Evaporators
☐	5258	Differential Gas Analyzer
☐	5259	Pressure Meters
☐	5260	Infrared Analyzer
☐	5261	Terminals
☐	5262	Control Valves
☐	5263	Pneumatic Controller
☐	5264	Industrial Thermometer
☐	5265	Level Transmitter
☐	5266	Mercury Relay
☐	5267a	Controlled-volume Pump
☐	5267b	"Controlled Volume Pumps in Paper Making"
☐	5267c	"Controlled Volume Pumps in Industrial Water Treating"
☐	5267d	"Controlled Volume Pumps in Process Instrumentation"
☐	5268	Dial Thermometer
☐	5269	Graphic Recorder
☐	5270	Flow Theory
☐	5271	High-speed Counter
☐	5272	Conductivity Controller
☐	5273	Industrial Liquid Meters (see coupon)
☐	5274	Control Systems
☐	5275	Continuous Feeder
☐	5276	Liquid-level Controller
☐	5277	Flow Calculations
☐	5278	Jet-pipe Regulator
☐	5279	Level Controller
☐	5280	Air Line Lubricators
☐	5281	Temperature Controller
☐	5282	Xerography
☐	5283	Liquid-level Gages
☐	5284	Rotameters
☐	5285	Conductivity Cell
☐	5286	Power Supplies
☐	5287	Gages
☐	5288	Drain & Sampling Valve
☐	5289	Strain Gages
☐	5290	Temperature, Humidity & Pressure Controller
☐	5291	Drafting Template
☐	5292	Recorder-Controllers
☐	5293	Strip Chart Printer
☐	5294	Indicator Lights
☐	5295	Liquid Gage
☐	5296	Autotransformers
☐	5297	pH Meter
☐	5298	Surface Thermometers
☐	5299	Computer
☐	5300	Control Systems
☐	5301	Control Valve
☐	5302	Control Valves
☐	5303	Safety Thermocouple
☐	5304	Humidity Recorder
☐	5305	Tube Ribbon
☐	5306a	Liquid-level Controls
☐	5306b	Ice Thickness Controls
☐	5306c	Non-conductive Liquids
☐	5306d	Standard Time Switches
☐	5306e	Cycle Repeating
☐	5306f	Program Clocks
☐	5306g	Time Delay Relays
☐	5306h	Automatic Reset Timers
☐	5306i	Electronic Timers
☐	5307	Temperature Recorder
☐	5308	Temperature Conversion Tables
☐	5309	Scanning System
☐	5310	Indicating Monitor
☐	5311	Electrical Instruments
☐	5312	Silver-cadmium Battery
☐	5313	Controller
☐	5314	Corrosion-resistant Pipe & Fittings
☐	5315	Aluminum Electrical Enclosures
☐	5316	Corrosion-proof Floor Surfacing
☐	5317	Fluorocarbon Plastic
☐	5318	Floor Coating
☐	5319	Sealed Motor
☐	5320	Chromium Impregnation
☐	5321a	Rubber Linings & Coverings
☐	5321b	Rubber- or Plastic-lined Valves
☐	5321c	Rubber-lined Pipe
☐	5321d	Acid Pails
☐	5322	Clad Steel Equipment
☐	5323	Jacketed Pipe Insulation
☐	5324	Plastic Salt Dissolvers
☐	5325	Self-priming Stainless Pumps
☐	5326	Blast Grit
☐	5327	Metal-treating Chemicals
☐	5328	Oil & Chemical-resistant Hose
☐	5329	Nickel-copper Alloy
☐	5330	Midget Pump
☐	5331	Teflon Pipe Dope
☐	5332a	Glassed-steel Reactor
☐	5332b	Jacketed Kettle
☐	5332c	Heat Exchanger
☐	5333	Tantalum
☐	5334	Self-priming Filter
☐	5335	Protective Coating
☐	5336	Plastic Fabrications
☐	5337	Protective Coating
☐	5338	Bituminous Coating
☐	5339	Pumps for Cutting Fluids
☐	5340	Heat Exchanger
☐	5341	Chemical Porcelain Equipment
☐	5342	Protective Coatings
☐	5343	Vinyl Resins
☐	5344	Unplasticized Polyvinyl Chloride
☐	5345	Tantalum
☐	5346	Metal Treatment
☐	5347	Glassed-steel Tank Trailer
☐	5348	Glass Shell & Tube Heat Exchanger
☐	5349a	Corrosion-proof Cement
☐	5349b	Protective Coating
☐	5349c	Corrosion-proof Tank Linings
☐	5350	Metallizing
☐	5351	Chemical Pump
☐	5352	Plastic-lined Pipe, Valves & Fittings
☐	5353	Fans
☐	5354	Neoprene Coating
☐	5355	Flexible Metal Hose
☐	5356	Mechanical Shaft Seal
☐	5357	PVC Piping
☐	5358	MoS2 Lube
☐	5359	Chemical Valves
☐	5360	Protective Coatings
☐	5361a	Truck & Drain Rack
☐	5361b	Drum & Barrel Sling
☐	5361c	Drum & Barrel Tilt
☐	5362	Chains & Sprockets
☐	5363	Glass-lined Storage Units
☐	5364	Scales
☐	5365	Telephones
☐	5366	Tubular Conveyor
☐	5367	Metal Grating
☐	5368	Segregating Valves
☐	5369	Tractor-Shovel
☐	5370	Tractor-Shovel (State Model)
☐	5371	Lift Truck
☐	5372	Shovel Loader
☐	5373	Drum Lift
☐	5374	Carboy Box
☐	5375	Conveyors
☐	5376	Recharge System
☐	5377	Flasher Scoreboard
☐	5378	Proportioning System
☐	5379	Air Conveyor
☐	5380	Lift Trucks
☐	5381	Dockboards
☐	5382	Portable Drum Elevator
☐	5383	Industrial Gloves
☐	5384	Vibrator
☐	5385	"Inside-out" Truck
☐	5386	Lined-steel Container
☐	5388	Scale
☐	5389	Hydraulic Clamp Attachment
☐	5390	Corrugated Boxes & Cartons
☐	5391	Booster
☐	5392	Impact Fittings
☐	5393	Air & Electric Vibrators
☐	5394	Covered Rollers
☐	5395	Magnet
☐	5396	Diesel Fork Truck
☐	5397	Scraper Storage Machines
☐	5398	Fittings
☐	5399	Ventilator
☐	5400	Serrated Grating & Stair Treads
☐	5401	Electric Pallet Truck
☐	5402	Scales
☐	5403	Oscillating Conveyor
☐	5404a	Jacketed Gaskets
☐	5404b	Snap-on Gaskets
☐	5404c	Expansion Joints
☐	5404d	Adaptors
☐	5404e	Reducers
☐	5405	Petroleum Acids and Bases
☐	5406	Pilot Plant Practices
☐	5407	Forged-steel Fittings
☐	5408a	Connector Panel
☐	5408b	Rotary Switch

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(Continued from reverse side of this sheet).

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✓	Key	Description
☐	5408c	Key & Push-button Switch
☐	5409	Lefax
☐	5410	Flow Meter
☐	5411	Thermometers
☐	5412	Gages
☐	5413	Safety Heads
☐	5414	Fire Protection
☐	5415	Industrial Gloves
☐	5416	Fire Monitor
☐	5417	Butterfly Valves
☐	5418a	Indicating Pyrometer
☐	5418b	Thermocouple Switch
☐	5418c	Pyrometer Accessory
☐	5419	Ventilation Fans
☐	5420	Gage
☐	5421	Motor Starters
☐	5422a	Signaling Horn
☐	5422b	Liquid-level Indicator
☐	5423	Gloves
☐	5424	Packings
☐	5425	Gas Generator
☐	5426	Dispenser
☐	5427	Hydraulic Fluids & Lubricants
☐	5428	Nickel-plated Pipe & Fittings
☐	5429	Safety Step Ladders
☐	5430	Detector System
☐	5431	Eye Shield
☐	5432	Infrared Analyzer
☐	5433	Power Roof Exhauster
☐	5434	Lining Brick
☐	5435	Aluminum Chain
☐	5436	Gas Analyzer
☐	5437	Ultrasonic Tester
☐	5438a	Electric Precipitator
☐	5438b	Fly Ash Collector
☐	5438c	Cyclone
☐	5439	Viscometer
☐	5440	Electric Heating Mantle
☐	5441	Small Batch Mixers
☐	5442	Trip Balances
☐	5443	Temperature Bath
☐	5444	Laboratory Filter
☐	5445	Surface Thermometer
☐	5446	Stainless & Monel Utensils
☐	5447	Micro-bellows Pump
☐	5448	Laboratory Glassware
☐	5449a	Ball & Pebble Mills
☐	5449b	Jar Mills & Rolling Machines
☐	5450	Rotary Pump
☐	5451	Vacuum Dryer
☐	5452	Borescopes
☐	5453	Liquid Indicator
☐	5454	X-ray Photometer
☐	5455	X-ray Diffraction
☐	5456	Dryers
☐	5457	Throw-away Bottles
☐	5458	Mortar Grinder
☐	5459	Spectral Lamp
☐	5460	Flow Controller
☐	5461a	Dry-batch Blender
☐	5461b	Crushers
☐	5461c	Grinders
☐	5461d	Pulverizers
☐	5461e	Separators
☐	5461f	Selectors
☐	5461g	Granulators
☐	5461h	Conveyors
☐	5462	Pulverizers (state requirements)
☐	5463	Ovens
☐	5464	Ion Exchangers
☐	5465	Gage Glasses
☐	5466	Infrared Spectrophotometer
☐	5467	Paper Wipers
☐	5468	Sequestering Agents

✓	Key	Description
☐	5469a	Continuous Thickener
☐	5469b	Plastic Reactors
☐	5469c	Wax Molding Press
☐	5470	Process Engineering
☐	5471a	Disc Separators
☐	5471b	Cylinder Separators
☐	5471c	Graders
☐	5472	Radiant-fired Furnaces
☐	5473	Self-cleaning Filter
☐	5474	Conical Dryer
☐	5475	Water Treatment System
☐	5476	Leaf Filter
☐	5477	Crusher
☐	5478	Vibrating Screen Separators
☐	5479	Drum & Barrel Handling Equipment
☐	5480	Visual Control Board
☐	5481	Process Tank
☐	5482	Heating Unit
☐	5483	Plastic Deflashing
☐	5484	Glass-lined Reactors
☐	5485	Continuous Centrifugal
☐	5486	Disintegrators
☐	5487	Centrifugal Air Separator
☐	5488	Sifters
☐	5489	Steel Log Washers
☐	5490	Plant Engineers
☐	5491	Solvent Extraction Column
☐	5492	Filter Presses
☐	5493	Rotary Batch Mixer
☐	5494	Compressed-gas Dryers
☐	5495	Impact Mill
☐	5496	Self-cleaning Tubular Filters
☐	5497	Heated Vibrating Screen
☐	5498	Steam and Hot Water Generators
☐	5499	Rotary Laminating Press
☐	5500	Mixer
☐	5501	Neoprene Filter Paper (state requirements)
☐	5502a	Electric Heaters
☐	5502b	Electric Heat Exchangers
☐	5503	Turbulent Entrainment Dryer
☐	5504	Coolers and Condensers
☐	5505	Hermetic Separator
☐	5506	Multiple-effect Evaporator
☐	5507	Double Drum Rotator
☐	5508a	Hard-rubber Valve
☐	5508b	Hard-rubber Pipe & Fittings
☐	5509	Chamber-type Reactor
☐	5510	Filter Material
☐	5511	Mutiwall Bag
☐	5512	Aerosol Packaging
☐	5513	"Under-the-cap" Filling Head
☐	5514	Lined Steel Containers
☐	5515	Bagging Scale
☐	5516	Metal Cans
☐	5517	Infrared Oven Section
☐	5518	Portable Bag Closer
☐	5519	Plastic Pump
☐	5520	Stencil Ink
☐	5521	Stapler
☐	5522	Capper
☐	5523	Drums & Barrels
☐	5524	Multiwall Bags
☐	5525	Auger Filler
☐	5528	Strapping Table
☐	5529	Label Tape
☐	5530	Fiber Drum
☐	5531a	Centrifugal Pump
☐	5531b	Acid-handling Pump
☐	5531c	Slurry Pump
☐	5532a	Positive-displacement Pump
☐	5532b	Duplex-diaphragm Pump
☐	5532c	Plunger Pump

✓	Key	Description
☐	5533a	Graphite Heat Exchanger (state which)
☐	5533b	Cascade Cooler
☐	5533c	Corrosion-resistant Pump
☐	5533d	Rupture Discs
☐	5533e	HCl Absorber
☐	5533f	Corrosion-resistant Pipe & Fittings
☐	5533g	Corrosion-resistant Valves
☐	5533h	Towers
☐	5533i	Plate Heaters
☐	5533j	Bayonet Heater
☐	5533k	Graphite Machined Components
☐	5534	Rust Conqueror
☐	5535a	Dissolvers
☐	5535b	Mills
☐	5536	Speed Reducer
☐	5537	Welding Electrodes
☐	5538	Fittings
☐	5539	Steam Traps
☐	5540	Spark-resistant Spray Gun
☐	5541a	Teflon Ring Packing
☐	5541b	Teflon Seal Cage
☐	5542	Tube Expander Drive
☐	5543	Positive-displacement Pump
☐	5544a	Filters
☐	5544b	Filter Tube
☐	5544c	Magnetic Separator
☐	5544d	Coolers & Clarifier
☐	5544e	Tubular Conveyor
☐	5545	Flexible Coupling
☐	5546	Double-ended Pump
☐	5547	Gas Cylinder
☐	5548	Dust Collector
☐	5549	Oscillating Torque Motor
☐	5550	Corrosion-resistant Diaphragm Valve
☐	5551	Valves
☐	5552	Air-cooled Condensers
☐	5553	Hot Oil Heating Systems
☐	5554	Corrosion-resistant Pumps
☐	5555	Thermal Conducting Cement
☐	5556	Jar Mills
☐	5557	Screw Conveyor Heat Exchanger
☐	5558	Industrial Ventilating Fan
☐	5559	Acid- and Base-resistant Lubricant
☐	5560	Filter Paper
☐	5561	Pumps
☐	5562	Portable Air Compressor
☐	5563	Slide Rules
☐	5564	Cellular Glass Insulation
☐	5565	Blowers
☐	5566	Cylinder
☐	5567	Regulator Valves
☐	5568	Liquid, Gas, Slurry Pump
☐	5569	Rotary Pressure Joint
☐	5570	High-precision Ceramic Balls
☐	5571	Oil Lubricant
☐	5572	Heat Exchange Equipment
☐	5573	Corrosion-resistant Coating
☐	5574	Pilot-operated Check Valve
☐	5575	Floor Resurfacer
☐	5576	Heat Exchanger Fabrication
☐	5577	Lined Processing Vessels
☐	5578	Centrifugal Pump
☐	5579	Contour Retainer Mesh
☐	5580	Quick-connect Fitting
☐	5581	Cooling & Heating Tube
☐	5582	Bronze Valve
☐	5583	Bronze Valves
☐	5584	Sprayed Coil Dehumidifiers
☐	5585	Metal Grating
☐	5586	Protective Paint

✓	Key	Description
☐	5587	Pre-mixed Grout
☐	5588	High-temperature Insulation
☐	5589	Chemical Pump
☐	5590	Tube Maintenance Equipment
☐	5591	High-pressure Hose
☐	5592	Porcelain Tower Packing
☐	5593	Pipe Compound
☐	5594	Piston Packing
☐	5595	Column Showers
☐	5596	Non-electric Magnet
☐	5597	Plastic Film
☐	5598	Hydraulic Systems
☐	5599	Corrosion-resistant Pump
☐	5600	Pulsating Panel Bin
☐	5601	Lubricated Plug Valve
☐	5602	Rotary Airlock
☐	5603	Canned Centrifugal Pump
☐	5604	Packaged Boiler
☐	5605	Plastic Exhaust Blowers
☐	5606	Water Coolers
☐	5607	Quick-Seal Hose Couplings
☐	5608	Drain Valve
☐	5609	Pipe Strainers
☐	5610	Expansion Joints
☐	5611	Steam Traps
☐	5612	Liquid Meter
☐	5613	Vacuum Pump
☐	5614	Sensitive Relays & Electrical Meters
☐	5615	Pipe Joint Compound
☐	5616	Roof Coolers
☐	5617	Valves
☐	5618	Rotary Joint
☐	5619	Convolute Diaphragms
☐	5620	Teflon Yarn Packing
☐	5621	Industrial Chemicals (state which)
☐	5622	Cathodic Protection Cable
☐	5623	Liquid-level Controllers
☐	5624	Mixer-Reactors
☐	5625	Molybdenum Silicides
☐	5626	Corrosion-proofing Materials
☐	5627	Boilers
☐	5628	Temperature Controller
☐	5629	Gages
☐	5630	Nitroparaffins (state which)
☐	5631	Polyethylenes for Injection Molding
☐	5632	Thermocouple
☐	5633	All-purpose Diaphragm Pump
☐	5634	Controller Renewal Parts
☐	5635	Dichlorophene
☐	5636	Vibrators
☐	5637	Spectrophotometers
☐	5638	Emergency Lighting
☐	5639	Isopropyl Ether
☐	5640	Scraper
☐	5641	Pressure Vessel & Process Equipment Fabrication
☐	5642	Valves
☐	5643	Hose Assemblies & Hose Couplings
☐	5644	Muller-type Mixer
☐	5645a	Tube Cleaner
☐	5645b	Tube Expander
☐	5646	Small Chemical Pumps
☐	5647	Butterfly Valves
☐	5648	Plasticizer for Vinyls
☐	5649	Corrugated Boxes
☐	5650	Welding Copper
☐	5651	Screen Separator
☐	5652	Hose
☐	5653	Vacuum Pump
☐	5654	Safety Helps
☐	5655	Refractory Materials

✓	Key	Description
☐	5656	Stainless Steel Tank
☐	5657	Butterfly Valves
☐	5658	Low-pressure Heating Boilers
☐	5659	Centrifugal Self-priming Pump
☐	5660a	Sump Pump
☐	5660b	Splitshell Pump
☐	5661	Filters
☐	5662	Lab Refrigerators
☐	5663	Chlorinated Paraffin
☐	5664	Nickel Fitting
☐	5665	Gaskets, Shims & Washers
☐	5666	Flexible Metal Hose
☐	5667	Waste Disposal
☐	5668	Turbo-dryers
☐	5669	Stencil Ink
☐	5670	Valves
☐	5671	Wire Cloth & Fabrication
☐	5672	Methyl n-Propyl Ketone
☐	5673	Conveyors
☐	5674	Magnesia-insulated Wire
☐	5675	Gas Analyzer
☐	5676	Flexible Ball Joint
☐	5677	Fire Protection
☐	5678	Tower Packing
☐	5679	Leak-proof Pump
☐	5680	Direct Flow Pump
☐	5681	Polyvinyl Alcohol Films
☐	5682	Bronzes
☐	5683	Fatty Acid Esters
☐	5684	Wire Mesh
☐	5685	Diaphragm Valve
☐	5686	Titanium
☐	5687	Mercury Switch
☐	5688	Plastic Panels
☐	5689	Asphaltic Coating
☐	5690	Stainless Fittings
☐	5691	High-velocity Burner
☐	5692	Vibration Control
☐	5693	Epichlorhydrin
☐	5694	Thrust Bearings
☐	5695	Turbine-type Pumps
☐	5696	Piping
☐	5697	Conveyor Systems
☐	5698	Tantalum for Sulfuric Acid
☐	5699	History of Bottles
☐	5700	Chemical Centrifuge
☐	5701	Expansion Joints
☐	5702a	Batch-mixing Calculator (see coupon)
☐	5702b	Pneumatic Agitators
☐	5703	Galvanizing
☐	5704	Centrifugal Pump
☐	5705	Aluminum
☐	5706	Steel Pails and Drums
☐	5707	Rotary Compressor (state use)
☐	5708	Corrosion-resistant Blowers
☐	5709	Screening
☐	5710	Filters, Mixers, Tanks
☐	5711	Liquid-level Controller
☐	5711A	Corrosion-resistant Pump
☐	5712	Spun Mineral Wool Insulation
☐	5713	Plastic Bags, Drum & Carton Liners
☐	5714	Process Heating Equipment
☐	5715	Safety Cans
☐	5716	Valves
☐	5717	Venturi Tube
☐	5718a	Fluid Meter
☐	5718b	Jacketed Pipe & Fittings
☐	5719	Teflon
☐	5720	Dewatering Presses
☐	5721	Concrete Floor Patch
☐	5722	Nickel Casting
☐	5723	Vinyl Mastic Coating

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Name ..... **Title** .....

Company ..... **Main Product** .....

Street Address of Company .....

City ..... **Zone No.** ..... **State** .....

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THAT'S INTERESTING

(*Continued from page 2*)

A motor that runs but it doesn't

Remember the little man who wasn't there? Well engineers at Minneapolis-Honeywell in their testing program for switches and relays have developed a motor that doesn't run, but acts like it does, and installed it in a full-size, fully-furnished bungalow that nobody lives in.

"This is ghost to ghost — all dead, nothing is on film"

Real motors wore out faster than equipment being tested. The "ghost" behaves like a real motor in operation but cannot wear out because it has no moving parts. It consists of an arrangement of resistors and inductors that duplicate a motor's electrical behavior. The house is on roof of company's plant and is used solely for engineering tests.

Wipe your feet please

Fabrics, particularly in rugs, can be treated to resist dirt and soiling from being walked on and from air-borne dirt and soot.

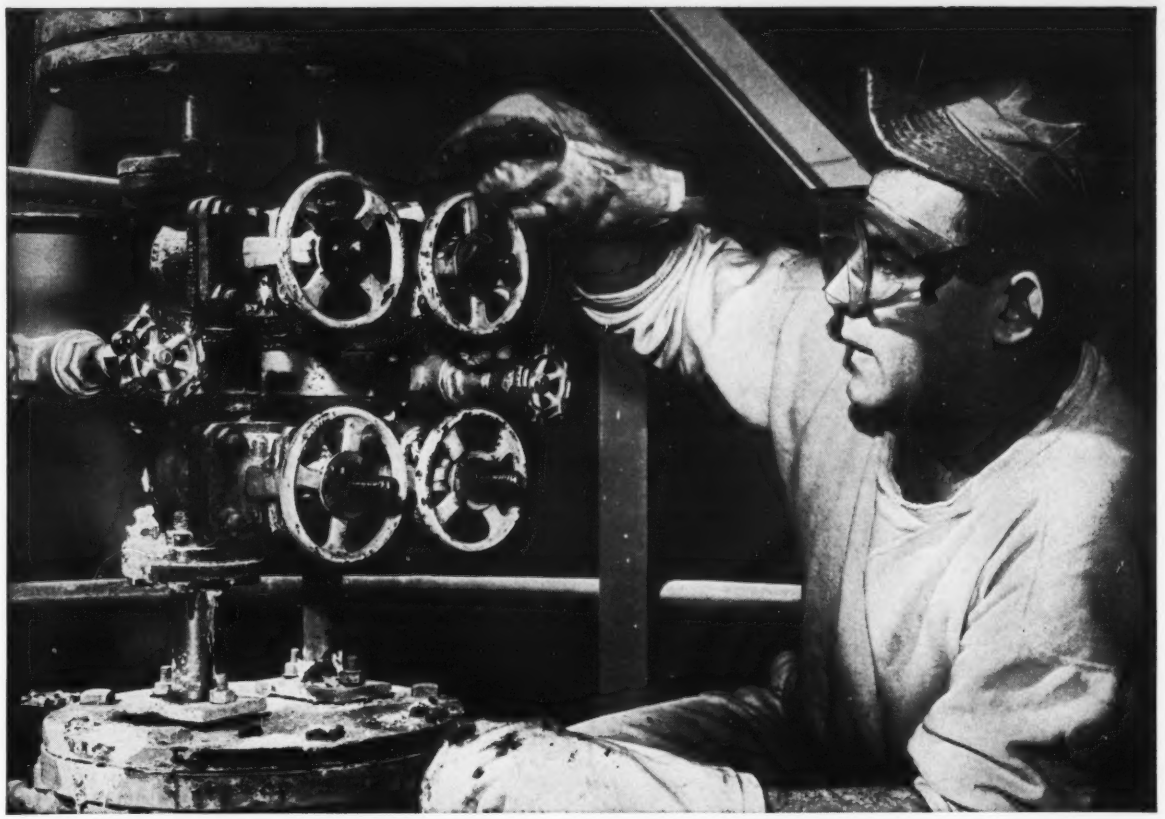
A chemical compound, Cyana, developed by American Cyanamid, fills the roughness of the fibers with an invisible, microscopic material, to prevent soil from clinging. Dirt that does accumulate can be more easily removed.

The soil retardant does not impair the smoothness or softness of the surface, has little or no effect on the light fastness of dyes, and does not "dust".

Photographs in vinyl

Continuous tone photographic images extending clear through a durable, flexible vinyl film are possible with a process developed by Ferro Chemical Corp.

Film is prepared from an organosol paste based on vinyl resins such as Bakelite containing light-sensitive, dye-forming and catalytic chemicals. It is exposed through a photographic negative to UV light for about one minute and developed by heating to 320°F for six minutes, or less time depending on temperature and exposure. Photographs appear in sepia tone or black. (*Bakelite Review*)



220 Answers. Here at the $15 million caustic soda-chlorine plant of the Hooker Electrochemical Company at Montague, Michigan, 220 Powell Valves made of Inco-Cast Nickel, solve the problem of handling hot caustic solutions. And service conditions are *tough*. Concentrations up to 73% . . . temperatures to 300°F. . . . pressures to 80 P.S.I.

Where service conditions are tough...

let INCO cast your troubles away!

When the Hooker Electrochemical Company was setting up its new $15 million caustic soda-chlorine plant at Montague, Michigan last year, they needed 220 of these valves.

Each of these valves had to be able to withstand hot, concentrated caustic — without permitting any iron pick-up that would contaminate the product.

Previous Experience Provides Answer

Over at their Niagara Falls plant, their project engineer, Mr. M. M. Brandegee, had already found the answer: Inco-Cast Nickel. He says:

"Our caustic soda is sold on low iron specifications. Therefore, it is imperative both on account of iron pick-up and equipment maintenance, that nickel be used wherever hot solutions are to be handled.

"Iron valves, particularly those handling 50%-73% caustic at the boiling points, would normally have a very short life. Nickel valves, normally, have a life of years."

Inco Casts Bodies in Nickel

That's why the bodies of these 220 Powell Valves are made of Inco-cast Nickel.

All Inco castings are cast to outlast destructive service. Whether of Nickel or any of seven other specially developed alloys, they're made by specialists in casting Inco Nickel Alloys. In any practical design or size. And all eight alloys are available as sand or centrifugal castings.

Get this new booklet

16-page case-history booklet, "CAST TO OUTLAST," describes how many destructive service problems are solved by use of Inco sand and centrifugal castings. Includes properties, alloys available, range of forms, specification data, brief notes on joining, machining. A copy is yours for the asking.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street New York 5, N. Y.

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Inco Castings Sand, Centrifugal, Precision

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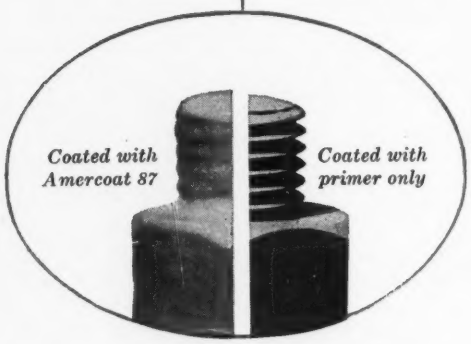

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1. Only one cross spray coat over a primed surface is required for complete protection—this means lower labor costs.
2. Fewer scaffolding and rigging shifts are required.
3. Less down time—dries to touch in minutes, eliminates the risk of contamination between coats.
4. Greater thickness means longer life—lower cost per square foot per year.

Amercoat 87's thixotropic characteristic helps provide extra thickness on sharp edges and irregular surfaces; it is non-porous and will not crack or check.

Amercoat 87 combines the time-tested chemical and weather resistance of vinyl coatings with the thickness of conventional mastics, yet is easily applied with standard industrial spray equipment.

We will be pleased to send you our technical bulletin describing this coating in detail.

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